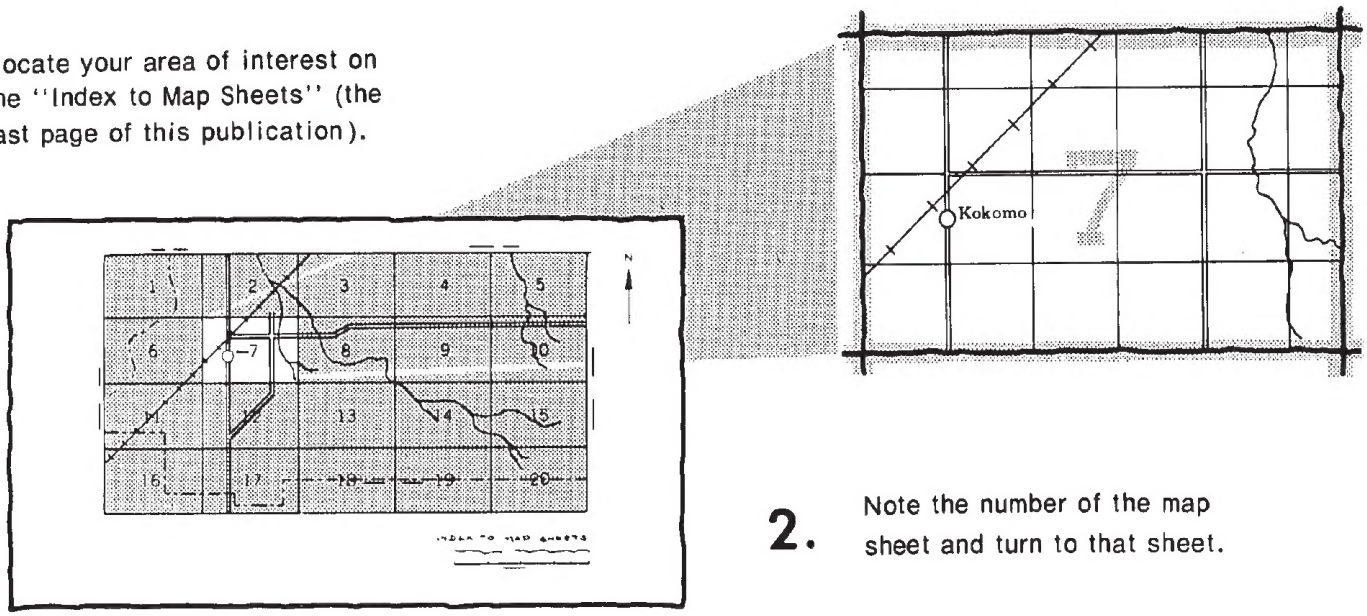
SOIL SURVEY OF

ESSEX COUNTY, MASSACHUSETTS NORTHERN PART

United States Department of Agriculture,
Soil Conservation Service,
in cooperation with
the Massachusetts Agricultural Experiment Station

HOW TO USE

1. Locate your area of interest on the "Index to Map Sheets" (the last page of this publication).



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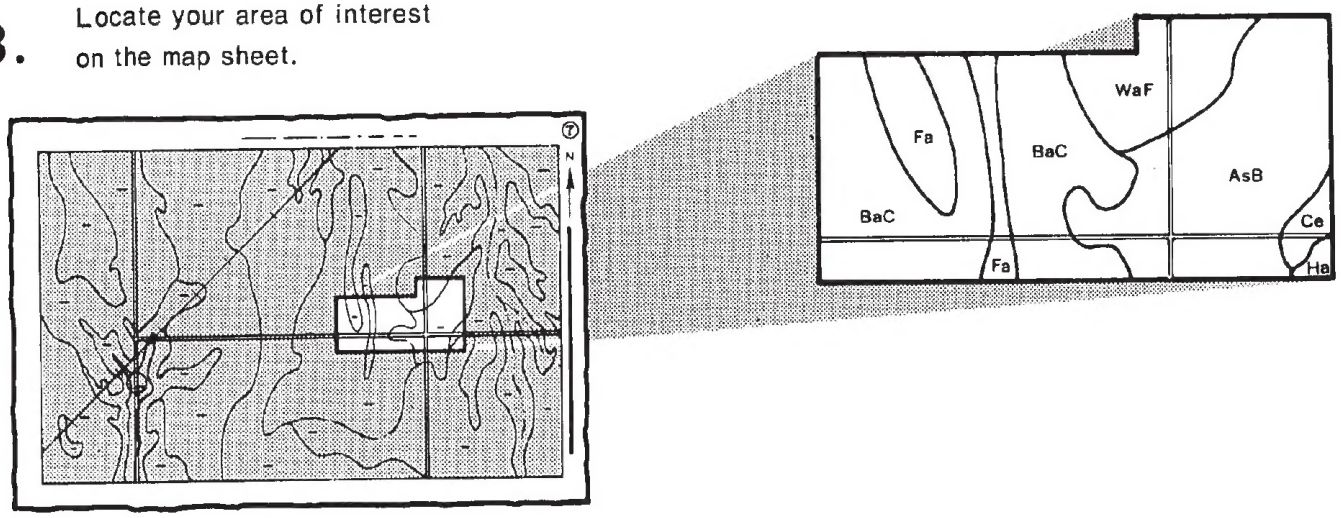

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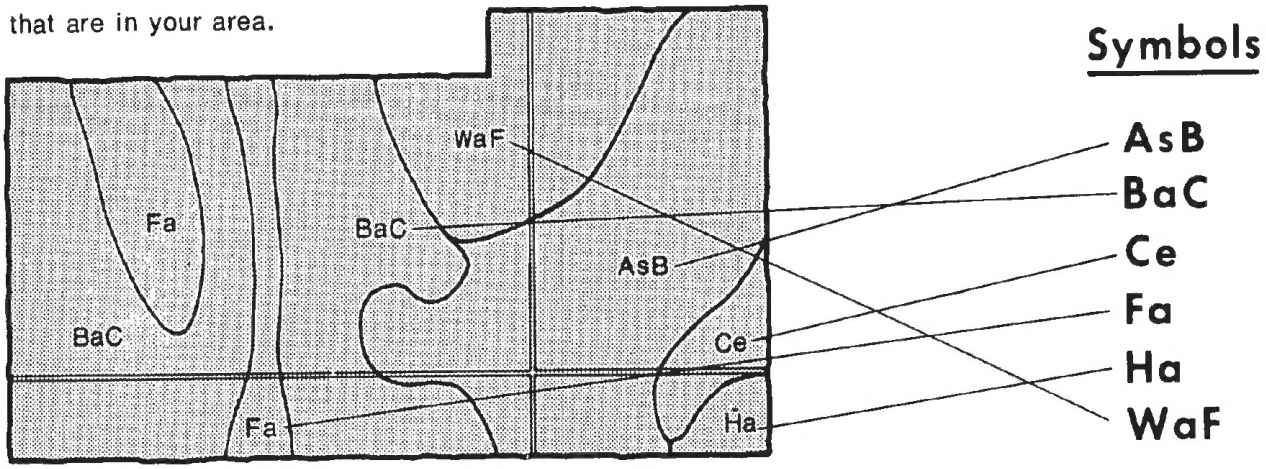

THIS SOIL SURVEY

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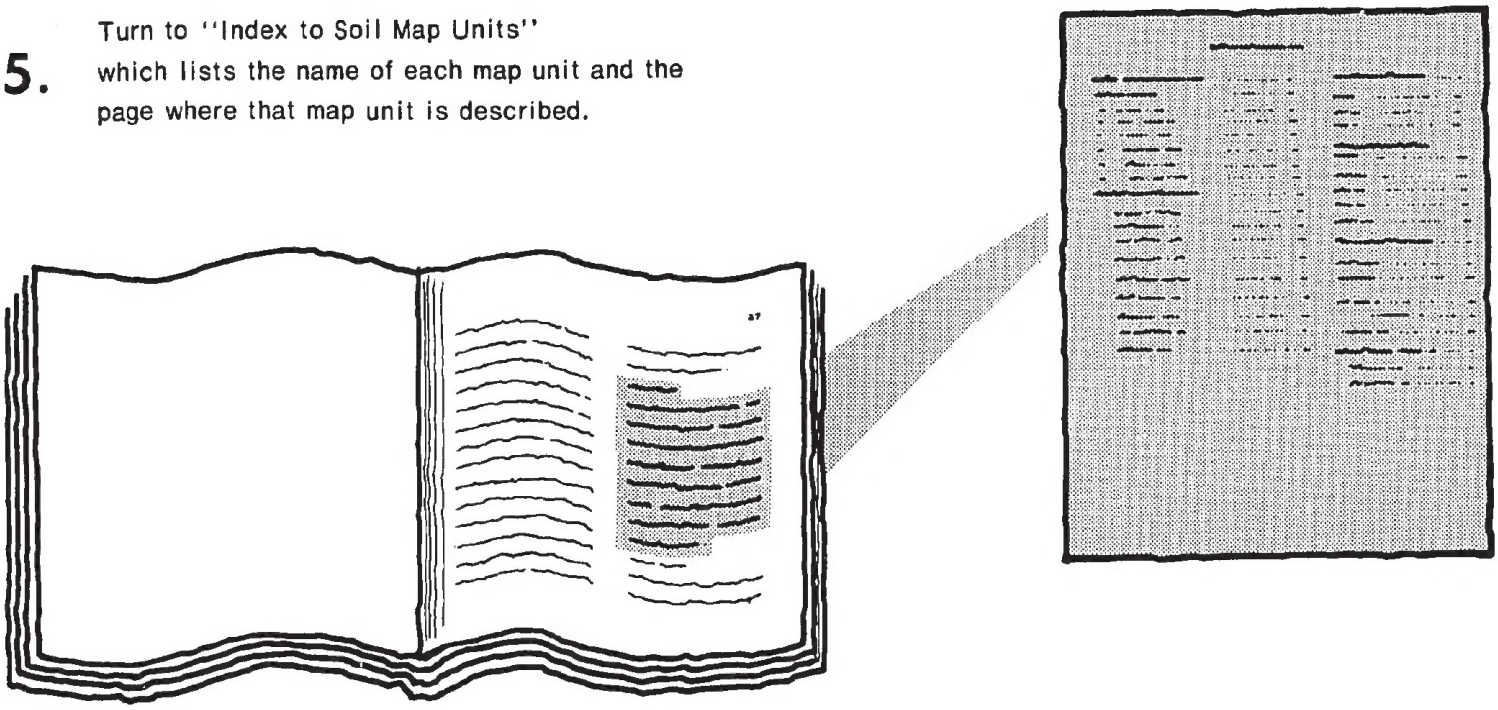
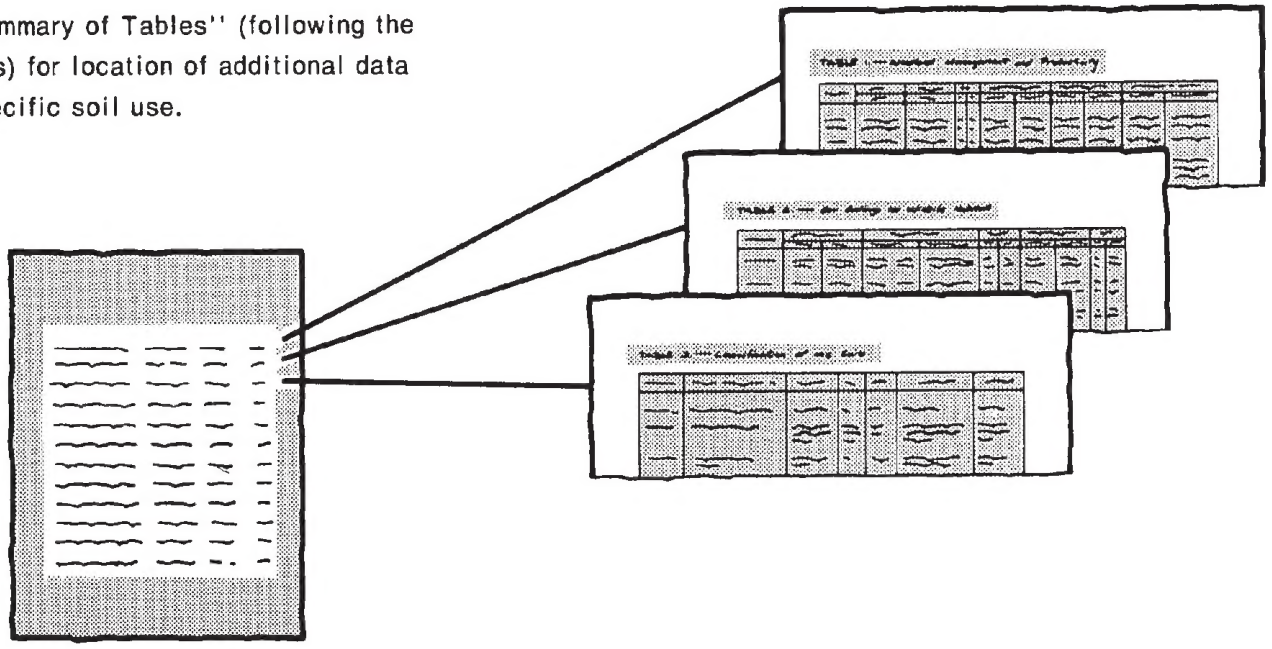


6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, usually the Agricultural Experiment Stations. In some surveys, other Federal and local agencies also contribute. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in the period 1966-77. Soil names and descriptions were approved in 1977. Unless otherwise indicated, statements in the publication refer to conditions in the survey area in 1978. This survey was made cooperatively by the Soil Conservation Service and the Massachusetts Agricultural Experiment Station. It is part of the technical assistance furnished to the Essex Conservation District.

Soil maps in this survey may be copied without permission, but any enlargement of these maps can cause misunderstanding of the detail of mapping and result in erroneous interpretations. Enlarged maps do not show small areas of contrasting soils that could have been shown at a larger mapping scale.

Cover: This farm pond in an area of Whitman soils provides water for irrigation and fire protection. The area in the foreground is gently sloping Sutton soils, and the hill adjacent to the barn is Charlton soils.

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Preface

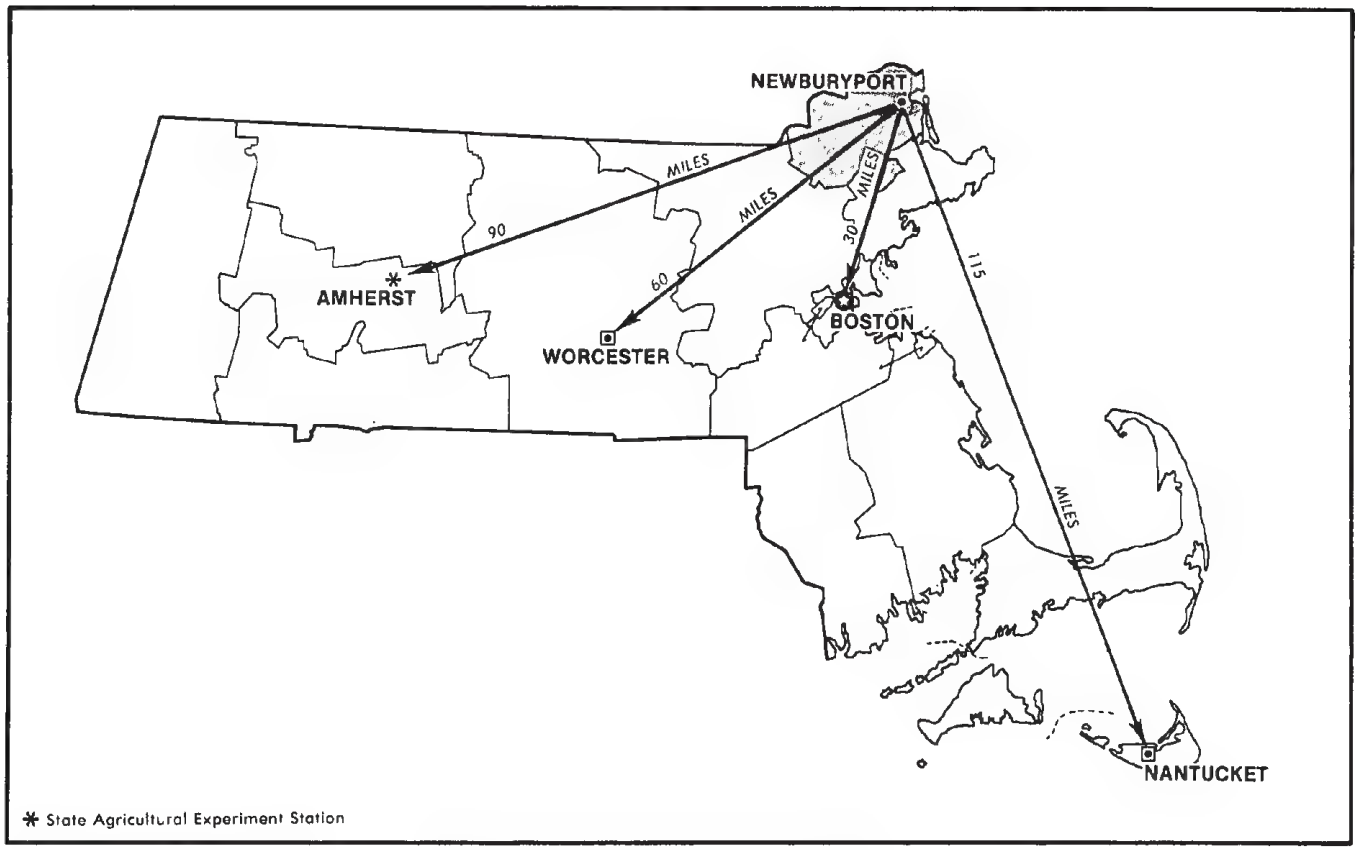
The Soil Survey of Essex County, Northern Part, contains much information useful in any land-planning program. Of prime importance are the predictions of soil behavior for selected land uses. Also highlighted are limitations or hazards to land uses that are inherent in the soil, improvements needed to overcome these limitations, and the impact that selected land uses will have on the environment.

This soil survey has been prepared for many different users. Farmers, foresters, and agronomists can use it to determine the potential of the soil and the management practices required for food and fiber production. Planners, community officials, engineers, developers, builders, and homebuyers can use it to plan land use, select sites for construction, develop soil resources, or identify any special practices that may be needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the soil survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur even within short distances. Soils may be seasonally wet or subject to flooding. They may be shallow to bedrock. They may be too unstable to be used as a foundation for buildings or roads. Very clayey or wet soils are poorly suited to septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map; the location of each kind of soil is shown on detailed soil maps. Each kind of soil in the survey area is described, and much information is given about each soil for specific uses. Additional information or assistance in using this publication can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

This soil survey can be useful in the conservation, development, and productive use of soil, water, and other resources.



Location of Essex County, Massachusetts, Northern Part.

SOIL SURVEY OF ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART

By Donald C. Fuller and Charles F. Hotz, Soil Conservation Service

Fieldwork by Donald C. Fuller and Everette L. Francis, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service, in cooperation with the Massachusetts Agricultural Experiment Station

ESSEX COUNTY is in the northeastern part of Massachusetts. The area surveyed for this report is 182,000 acres, or 284.4 square miles. The major topographic features are drumloidal hills, rolling moraines, and dissecting river valleys. The Merrimack River, Parker River, Rowley River, and Ipswich River provide most of the drainage in the survey area. Elevation ranges from sea level at the eastern edge of the survey area to 420 feet above sea level at the top of Holt Hill in Andover.

General nature of the area

This section gives general information concerning the survey area. It discusses climate, physiography, relief and drainage, and history and development.

Climate

In Essex County winters are cold and summers are warm. The start and the end of the warm period are influenced by the Atlantic Ocean. In winter the ground is frequently, but not continuously, covered with snow. Total annual precipitation is nearly always adequate for crops that are suited to local temperatures.

Table 1 gives data on temperature and precipitation for the survey area, as recorded at Middleton, Massachusetts, for the period 1951 to 1975. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 30 degrees F, and the average daily minimum temperature is 20 degrees. The lowest temperature on record, which occurred at Middleton on January 24, 1961, is -20 degrees. In summer the average temperature is 69 degrees, and the average daily maximum temperature is 79 degrees. The highest recorded temperature, which occurred on August 3, 1975, is 102 degrees.

Growing degree days, shown in table 1, are equivalent to heat units. During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

Of the total annual precipitation, 20 inches, or 47 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 16 inches. The heaviest 1-day rainfall during the period of record was 8.64 inches at Middleton on October 6, 1962. Thunderstorms occur on about 20 days each year, and most occur in summer.

Average seasonal snowfall is 48 inches. The greatest snow depth at any one time during the period of record was 45 inches. On the average, 20 days have at least 1 inch of snow on the ground, but the number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 70 percent. The percentage of possible sunshine is 70 in summer and 50 in winter. The prevailing wind is from the northwest. Average windspeed is highest, 14 miles per hour, in winter.

Winter storms moving toward the northeast along the coast frequently bring rain and thawing and then more snow and cold weather. In summer, sea breezes frequently moderate the temperature, particularly in areas near the coast.

Climatic data in this section were specially prepared for the Soil Conservation Service by the National Climatic Center, Asheville, North Carolina.

Physiography, relief, and drainage

The eastern part of the survey area consists of a smooth plain dotted with round and oval hills that rise

sharply to a height of about 100 feet above the plain. This area begins at the coast, covers the salt marshes west of Plum Island and Salisbury, and rises gradually inland to Amesbury, the western part of Newburyport, and the eastern parts of Georgetown and Boxford. The western part of the survey area consists of a rolling plain studded with isolated hills, some of which cover an area of several square miles. These hills are round and oval and range from about 200 to 400 feet in elevation.

The northern and western parts of the survey area are drained by the Merrimack River, which flows in a general northeasterly direction from Andover and Methuen to Newburyport and Salisbury. The central part of the area is drained by the Parker River, which flows in an easterly direction from Boxford through Georgetown and Newbury to the Plum Island River. The southern edge of the survey area is drained by the Rowley River and the Ipswich River.

History and development

In 1628 John Endicott began a plantation in Salem, the first settlement in what is now Essex County. Early colonial enterprises in the survey area consisted mainly of subsistence farming, fishing, and lumbering. Mills were established next to rivers, enabling use of the water as a source of power.

The general subsistence farming of the early settlers developed, and much of the produce was sold to the inhabitants of the area. The coming of the railroads brought western competition and a subsequent decline in the need for and production of local food crops. As the industrial towns in the area continued to develop and the population increased, there came a need for more variety in farming. Specialized forms of farming—dairying, orcharding, market gardening, and raising poultry—began to take the place of general farming, and the farm acreage in the area declined steadily.

The demand for more land to meet the needs of urban, suburban, and industrial growth has caused a further decline in the amount of land used for farming. The survey area has about 250 farms, with an average size of less than 100 acres. From 1951 to 1971, the acreage of farmland decreased by 40 percent, the acreage of woodland decreased by 5 percent, and the acreage of urban land increased by 105 percent.

How this survey was made

Soil scientists made this survey to learn what kinds of soil are in the survey area, where they are, and how they can be used. The soil scientists went into the area knowing they likely would locate many soils they already knew something about and perhaps identify some they had never seen before. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; the kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material, which has been changed very little by leaching or by the action of plant roots.

The soil scientists recorded the characteristics of the profiles they studied, and they compared those profiles with others in counties nearby and in places more distant. Thus, through correlation, they classified and named the soils according to nationwide, uniform procedures.

After a guide for classifying and naming the soils was worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, roads, and other details that help in drawing boundaries accurately. The soil map at the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called soil map units. Some map units are made up of one kind of soil, others are made up of two or more kinds of soil, and a few have little or no soil material at all. Map units are discussed in the section map "Soil maps for detailed planning."

While a soil survey is in progress, samples of soils are taken as needed for laboratory measurements and for engineering tests. The soils are field tested, and interpretations of their behavior are modified as necessary during the course of the survey. New interpretations are added to meet local needs, mainly through field observations of different kinds of soil in different uses under different levels of management. Also, data are assembled from other sources, such as test results, records, field experience, and information available from state and local specialists. For example, data on crop yields under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it is readily available to different groups of users among them farmers, managers of woodland, engineers, planners, developers and builders, homebuyers, and those seeking recreation.

General soil map for broad land use planning

The general soil map at the back of this publication shows, in color, soil associations that have a distinct pattern of soils and of relief and drainage. Each associ-

ation is a unique natural landscape. Typically, an association consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one association can occur in others but in a different pattern.

The general soil map provides a broad perspective of the soils and landscapes in the survey area. It provides a basis for comparing the potential of large areas for general kinds of land use. Areas that are, for the most part, suited to certain kinds of farming or to other land uses can be identified on the map. Likewise, areas of soils having properties that are distinctly unfavorable for certain land uses can be located.

Because of its small scale, the map does not show the kind of soil at a specific site. Thus, it is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The kinds of soil in any one map unit differ from place to place in slope, depth, stoniness, drainage, or other characteristics that affect their management.

Descriptions of soil associations

1. Ipswich-Westbrook-Udipsamments association

Deep, nearly level, very poorly drained, mucky soils formed in organic deposits; gently sloping to very steep, excessively drained, sandy soils formed in windblown sand

Areas of this association are along the eastern edge of the survey area in tidal marshes and on sand dunes adjacent to the ocean.

This association occupies about 8 percent of the survey area. The association is about 31 percent Ipswich soils, 22 percent Westbrook soils, 8 percent Udipsamments, and 39 percent soils of minor extent (fig. 1).

These very poorly drained, nearly level Ipswich and Westbrook soils are subject to tidal flooding. The Westbrook soils are underlain by loamy mineral soil material at a depth of 16 to 51 inches. The Ipswich soils consist of organic deposits more than 51 inches thick. The excessively drained, gently sloping to very steep Udipsamments are droughty and consist of wind-deposited sand. They are only partly stabilized by vegetation and are extremely susceptible to scouring and wind erosion (fig. 2).

The minor soils in this association include very poorly drained Scarboro soils, excessively drained Windsor soils, somewhat excessively drained Merrimac soils, and

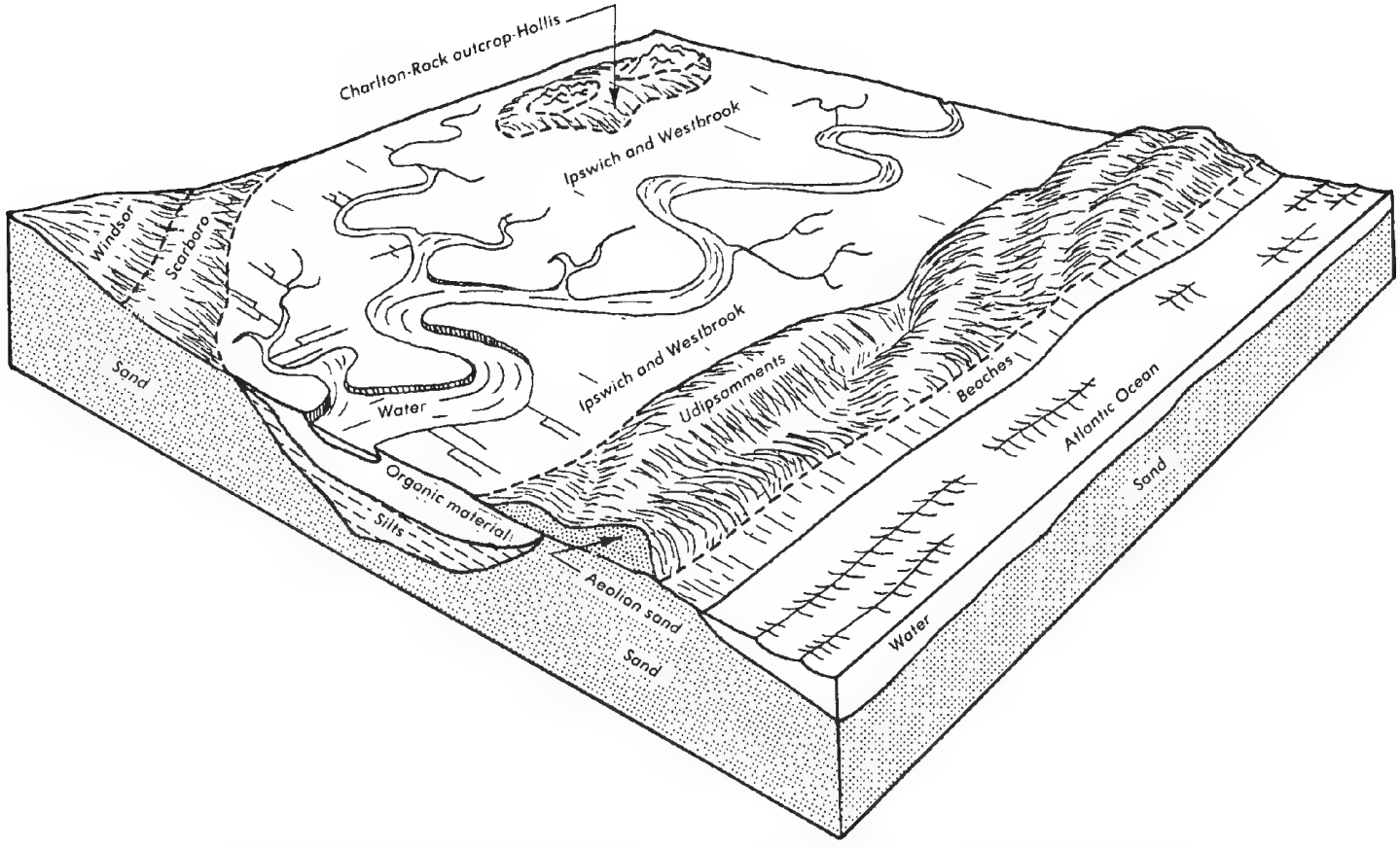


Figure 1.—Typical pattern of soils and parent material in the Ipswich-Westbrook-Udipsamments association.

Figure 2.—A typical area of Udipsamments.

Beaches. Also included are areas of Charlton-Rock outcrop-Hollis complex.

The soils in this association are used mainly for recreation. Some areas are used for wildlife habitat, and some, especially areas of Udipsamments, are used for urban development. The Ipswich and Westbrook soils are covered with salt-tolerant grasses and sedges, a few small areas of which are harvested and used for mulch or packing (fig. 3). Some bare areas are mud flats that provide habitat for shellfish.

The soils of this association are suitable for limited recreational uses and for development of wildlife habitat. The wetness, tidal flooding, and high organic matter content of the Ipswich and Westbrook soils and the droughtiness, susceptibility to erosion, and low fertility of Udipsamments make the association poorly suited to most other uses.

2. Hinckley-Windsor-Merrimac association

Deep, nearly level to steep, excessively drained and somewhat excessively drained, sandy and loamy soils formed in outwash deposits

Areas of this association are scattered throughout the survey area on plains, stream terraces, kames, and

Figure 3.—An area of Ipswich and Westbrook soils used for the production of saltmarsh hay.

eskers. The areas are typically at a lower elevation than the surrounding land.

This association occupies about 32 percent of the survey area. The association is about 21 percent Hinckley soils, 16 percent Windsor soils, 9 percent Merrimac soils, and 54 percent soils of minor extent (fig. 4).

Excessively drained Hinckley soils are on kames, eskers, plains, and terraces. They have a sandy subsoil underlain by sand and gravel. Excessively drained Windsor soils are mostly on terraces. They have a sandy subsoil underlain by sand. Somewhat excessively drained Merrimac soils are on plains, terraces, and moraines. They have a loamy subsoil underlain by sand and gravel.

The minor soils in this association include very poorly drained Medisaprists and Scarboro soils, poorly drained Wareham soils, moderately well drained Deerfield and Sudbury soils, and well drained Canton soils.

Most of this association is wooded and in urban developments. A few areas are used for truck farms and dairy farms, and a few are in swamps and marshes. Most areas of the association were once cleared and cultivated or pastured. The steeper parts have reverted to woodland or have been planted to trees.

The soils of this association are generally suitable for farming and residential development. Some parts of the association are droughty and steep, and most of the minor soils have a seasonal high water table in winter and spring.

3. Paxton-Woodbridge-Montauk association

Deep, nearly level to steep, well drained and moderately well drained, loamy soils formed in compact glacial till

Areas of this association are scattered throughout the western part of the survey area on hills and sloping

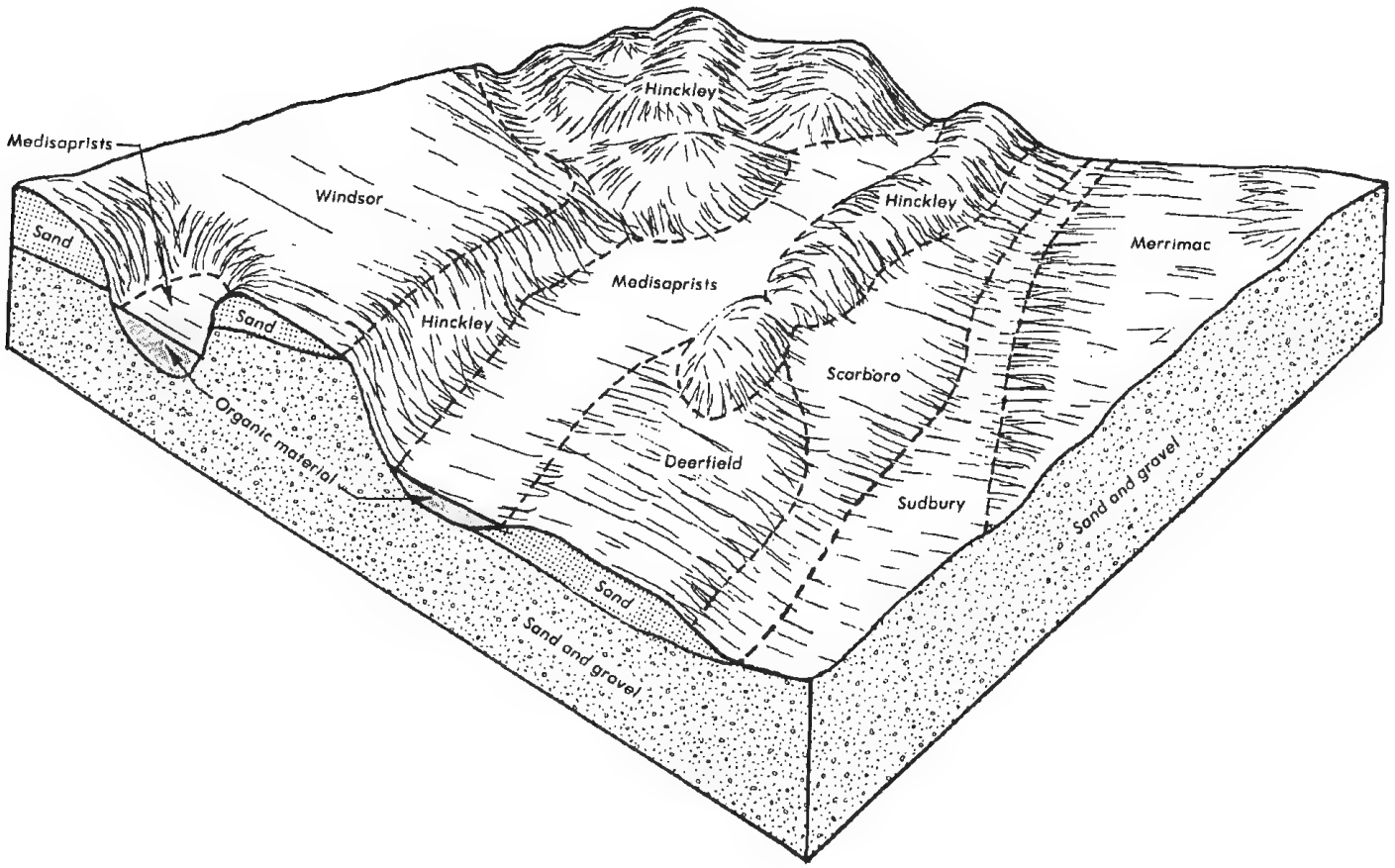


Figure 4.—Typical pattern of soils and parent material in the Hinckley-Windsor-Merrimac association.

uplands. Most of the higher elevations in the survey area are in this association.

This association occupies about 22 percent of the survey area. The association is about 35 percent Paxton soils, 25 percent Woodbridge soils, 11 percent Montauk soils, and 29 percent soils of minor extent (fig. 5).

Well drained Paxton and Montauk soils are on the sides of drumlins and hills. Moderately well drained Woodbridge soils are on nearly level tops of hills, concave toe slopes, and gently sloping areas. All three soils have a loamy subsoil underlain by a fragipan at a depth of about 2 feet. The fragipan is loamy in the Paxton and Woodbridge soils and sandy in the Montauk soils.

The minor soils in this association include moderately well drained Scituate soils, poorly drained Ridgebury soils, and very poorly drained Whitman soils.

Most areas of this association are wooded, and many are used for urban development. A few areas are used for dairy farms and apple orchards, and a few are in swamps and marshes. Most of the once farmed land has reverted to woodland or has been planted to trees.

The soils of the association are suitable for dairy farming, apples, and truck crops. They are well suited to residential development if sewage disposal facilities are available. The main limitations for residential development are the slowly permeable fragipan, steep slopes in some areas, and a seasonal high water table in areas of the Woodbridge soils.

4. Canton-Charlton-Sutton association

Deep, nearly level to steep, well drained and moderately well drained, loamy soils formed in friable glacial till

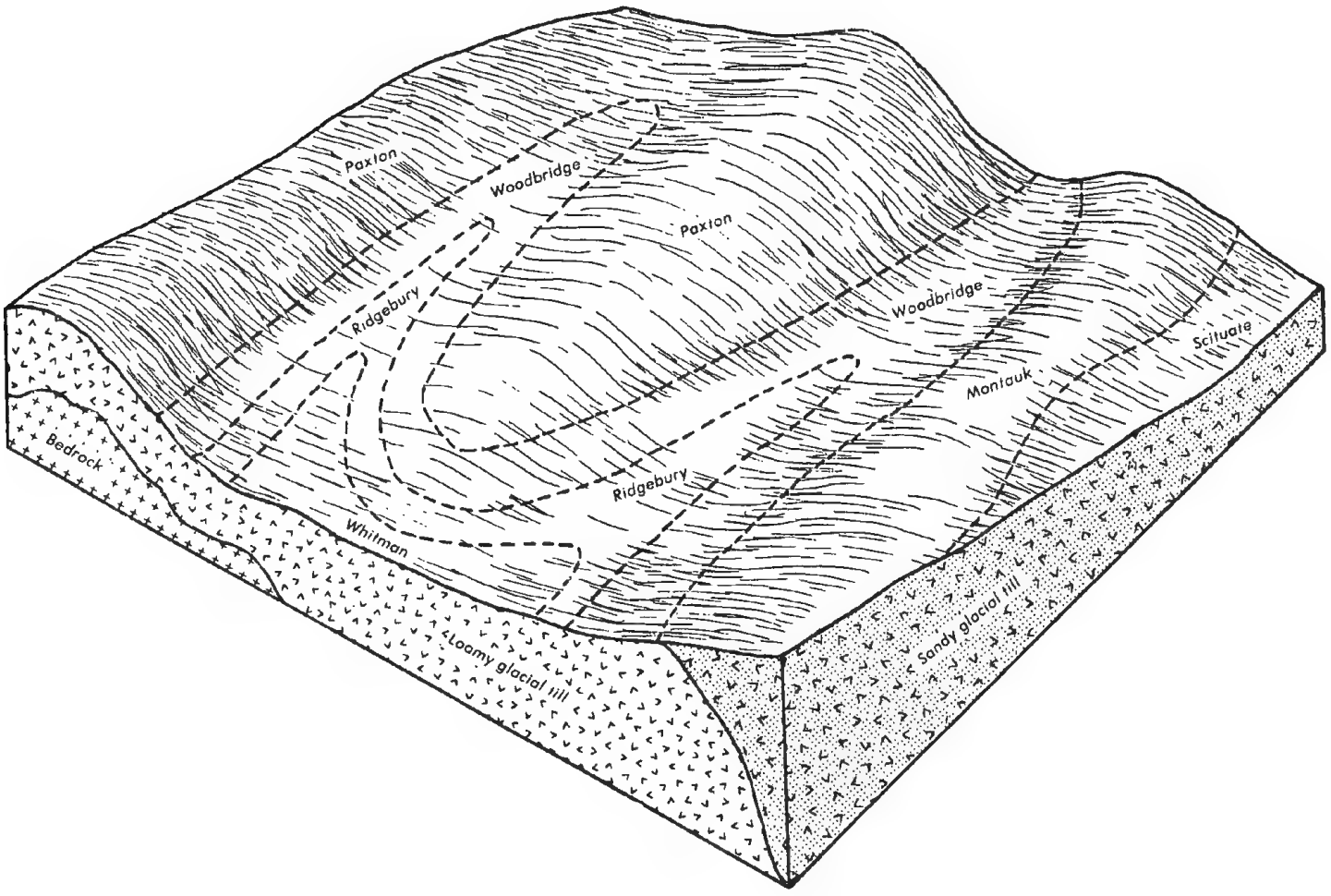


Figure 5.—Typical pattern of soils and parent material in the Paxton-Woodbridge-Montauk association.

Areas of this association are scattered throughout the western part of the survey area. The areas consist of low, irregular hills with a few bedrock exposures.

This association occupies about 20 percent of the survey area. The association is about 40 percent Canton soils, 15 percent Charlton soils, 12 percent Sutton soils, and 33 percent soils of minor extent (fig. 6).

Well drained Canton and Charlton soils are on the tops and sides of low hills. Moderately well drained Sutton soils are on the toe slopes of hills and in slight depressions. The Canton soils have a loamy subsoil underlain by gravelly and sandy material. The Charlton and Sutton soils are loamy throughout. They have stones in the soil, and many areas have stones on the surface. The Sutton soils have a seasonal high water table in winter and spring.

The minor soils in this association include very poorly drained Medisaprists and Whitman soils, poorly drained Leicester soils, shallow Hollis soils, and rock outcrops.

Most areas of this association are in woodland. Many areas that once were farmed have reverted to woodland or have been planted to trees. Some areas have been developed for residential or other nonfarm purposes. A few are in dairy farms and small market gardens, and a few are in marshes and swamps.

The soils of this association are suitable for dairy farming, orchards, and truck crops. Most areas are well suited for residential development. The main limitations of the Canton and Charlton soils for residential development are slope and stones in and on the surface layer. Use of the Sutton soils is limited by the seasonal high water table.

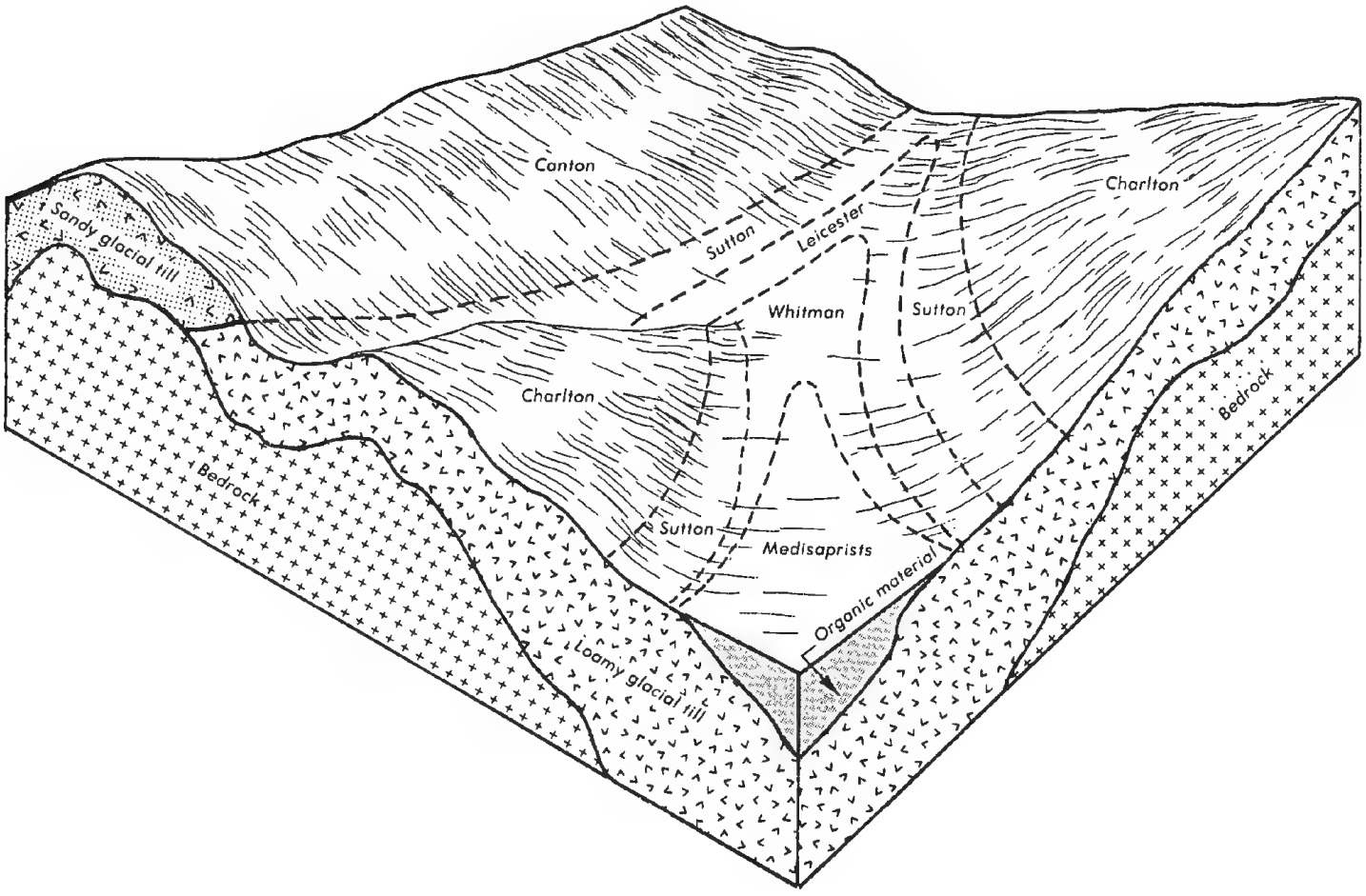


Figure 6.—Typical pattern of soils and parent material in the Canton-Charlton-Sutton association.

5. Scantic-Maybid-Buxton association

Deep, nearly level to moderately sloping, very poorly drained to moderately well drained, loamy soils formed in lacustrine or marine sediments

Areas of this association are scattered throughout the eastern half of the survey area. The elevation of the areas ranges from near sea level to about 50 feet above sea level.

This association occupies about 7 percent of the survey area. The association is about 25 percent Scantic soils, 21 percent Maybid soils, 14 percent Buxton soils, and 40 percent soils of minor extent (fig. 7).

Scantic soils in most places are at a slightly higher elevation than the Maybid soils and a lower elevation than the Buxton soils. All three soils have a loamy mantle underlain by clayey material. The Scantic soils are poorly drained, the Maybid soils very poorly drained, and the Buxton soils moderately well drained. Most areas of the association have a seasonal high water table in winter and spring.

The minor soils in this association include moderately well drained Belgrade and Elmwood soils, well drained Suffield soils, poorly drained Raynham and Swanton soils, very poorly drained Medisaprists, and rock outcrops.

The soils in this association are used mainly for pasture or hay, or they are idle. Some areas of Buxton soils are used for corn. The idle areas have a cover of water-tolerant native grasses and a few shrubs. A few areas of the association have been drained, but there are many swampy, undrained areas.

The soils of this association are suitable for hay and pasture and poorly suited for residential development. Areas of Buxton soils are suitable for some cultivated crops. The soils have good potential for wetland wildlife habitat. Wetness is the main limitation for most uses of these soils. Some areas are flooded or have water ponded on the surface in winter and spring.

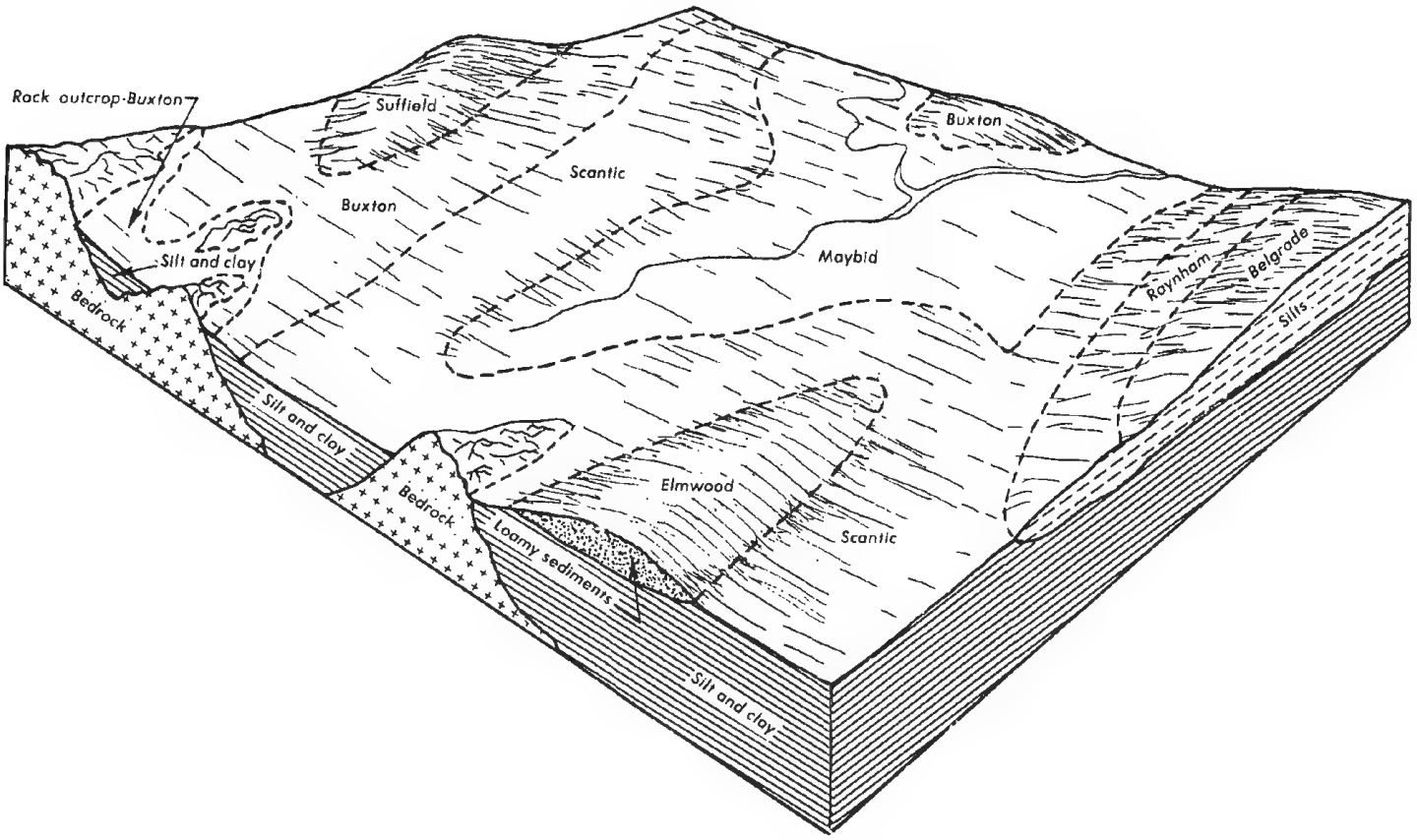


Figure 7.—Typical pattern of soils and parent material in the Scantic-Maybid-Buxton association.

6. Charlton-Rock outcrop-Medisaprists association

Deep, nearly level to steep, well drained, loamy soils formed in glacial till; Rock outcrop; and deep, nearly level, very poorly drained, mucky soils formed in organic deposits

Areas of this association are scattered throughout the southern and western parts of the survey area. The areas consist of low, irregular hills, ridges, and plains and common bedrock exposures and depressions of very poorly drained, organic soils.

This association occupies about 11 percent of the survey area. The association is about 30 percent Charlton soils, 15 percent Rock outcrop, 15 percent Medisaprists, and 40 percent soils of minor extent (fig. 8).

Well drained, loamy Charlton soils are on the tops and sides of low hills and ridges. Many areas have stones on the surface. The areas of Rock outcrop protrude through the tops and sides of the hills and ridges. Medisaprists are organic soils that are between the ridges and hills and are in pockets or depressions in the plains. Medisaprists are very poorly drained and have a seasonal high water table at or near the surface most of the year.

The minor soils in this association include shallow Hollis soils, well drained Canton soils, moderately well drained Sutton soils, poorly drained Leicester soils, and very poorly drained Whitman soils.

Most areas of this association are in woodland. Some areas are in residential development, and some are in swamp and marshes.

The soils of this association, especially the Charlton soils, are suitable for woodland and for woodland wildlife habitat. Medisaprists have good potential for wetland wildlife habitat. The Charlton soils are suitable for residential developments, but wetness and a high organic

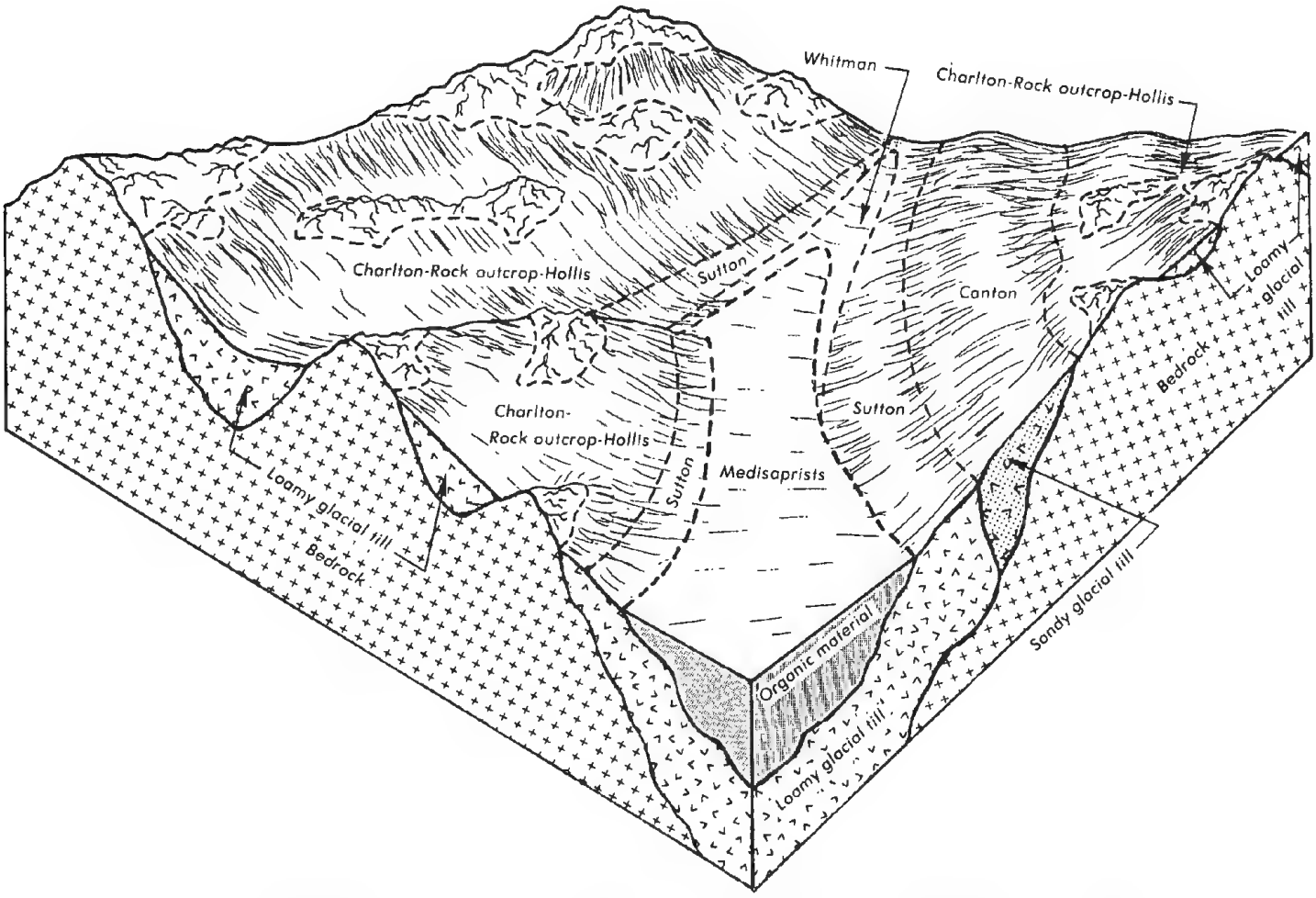


Figure 8.—Typical pattern of soils and parent material in the Charlton-Rock outcrop-Medisaprists association.

matter content limit the Medisaprists for this use. The main limitations of the higher areas of the association are the frequent outcroppings of bedrock and slope.

Soil maps for detailed planning

The map units shown on the detailed soil maps at the back of this publication represent the kinds of soil in the survey area. They are described in this section. The descriptions together with the soil maps can be useful in determining the potential of a soil and in managing it for food and fiber production; in planning land use and developing soil resources; and in enhancing, protecting, and preserving the environment. More information for each map unit, or soil, is given in the section "Use and management of the soils."

Preceding the name of each map unit is the symbol that identifies the soil on the detailed soil maps. Each soil description includes general facts about the soil and a brief description of the soil profile. In each description, the principal hazards and limitations are indicated, and the management concerns and practices needed are discussed.

The map units on the detailed soil maps represent an area on the landscape made up mostly of the soil or soils for which the unit is named. Most of the delineations shown on the detailed soil map are phases of soil series.

Soils that have a profile that is almost alike make up a *soil series*. Except for allowable differences in texture of the surface layer or of the underlying substratum, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement in the profile. A soil series commonly is named for a town or geographic feature near the place where a soil of that series was first observed and mapped. The Canton series, for example, was named for the town of Canton in Norfolk County.

Soils of one series can differ in texture of the surface layer or in the underlying substratum and in slope, erosion, stoniness, salinity, wetness, or other characteristics that affect their use. On the basis of such differences, a soil series is divided into phases. The name of a *soil phase* commonly indicates a feature that affects use or management. For example, Canton very stony fine sandy loam, 8 to 15 percent slopes, is one of several phases within the Canton series.

Some map units are made up of two or more dominant kinds of soil. Such map units are called soil complexes and undifferentiated groups.

A *soil complex* consists of areas of two or more soils that are so intricately mixed or so small in size that they cannot be shown separately on the soil map. Each area includes some of each of the two or more dominant soils, and the pattern and proportion are somewhat similar in all areas. Rock outcrop-Hollis complex is an example.

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because there is little value in separating them. The pattern and proportion of the soils are not uniform. An area shown on the map has at least one of the dominant (named) soils or may have all of them. Limerick and Rumney soils is an undifferentiated group in this survey area.

Most map units include small, scattered areas of soils other than those that appear in the name of the map unit. Some of these soils have properties that differ substantially from those of the dominant soil or soils and thus could significantly affect use and management of the map unit. These soils are described in the description of each map unit. Some of the more unusual or strongly contrasting soils that are included are identified by a special symbol on the soil map.

Most mapped areas include places that have little or no soil material and support little or no vegetation. Such places are called *miscellaneous areas*; they are delineated on the soil map and given descriptive names. Pits, gravel, is an example. Some of these areas are too small to be delineated and are identified by a special symbol on the soil map.

The acreage and proportionate extent of each map unit are given in table 4, and additional information on properties, limitations, capabilities, and potentials for many soil uses is given for each kind of soil in other tables in this survey. (See "Summary of Tables.") Many of the terms used in describing soils are defined in the Glossary.

Map unit descriptions

AgA—Agawam fine sandy loam, 0 to 3 percent slopes. This deep, nearly level, well drained soil is on outwash plains and stream terraces. Slopes are smooth and are 200 to 500 feet long. The areas are irregular in shape and range from 5 to 25 acres.

Typically, the surface layer is very friable, very dark grayish brown fine sandy loam about 9 inches thick. The subsoil is very friable, yellowish brown fine sandy loam 21 inches thick. The substratum is light olive brown, stratified fine sand and loamy fine sand to a depth of 60 inches or more.

Included with this soil in mapping are areas, mainly less than 4 acres each, of Ninigret and Walpole soils that make up about 20 percent of the unit.

The permeability of this soil is moderately rapid or rapid in the subsoil and rapid in the substratum. Available water capacity is moderate. In unlimed areas the soil is medium acid to very strongly acid. The rooting zone extends into the substratum.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or have been planted to trees, and some areas are in residential developments.

This soil is well suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas, and the hazard of erosion is slight. Mixing crop residue and manure into the surface layer improves tilth and increases the organic matter content of the soil. The use of proper stocking rates, deferred grazing, and pasture rotation are the main pasture management needs.

The soil is generally suitable for trees, for openland and woodland wildlife habitat, for recreational developments such as camp areas, picnic areas, and playgrounds, and for residential developments. The soil is suitable for septic tank absorption fields, but the rapid permeability in the substratum limits use of the soil as a site for other types of waste disposal.

This unit is in capability class I.

AgB—Agawam fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, well drained soil is on outwash plains and stream terraces. Slopes are smooth, undulating, and 200 to 800 feet long. The areas are irregular in shape and range from 10 to 50 acres.

Typically, the surface layer is very friable, very dark grayish brown fine sandy loam about 9 inches thick. The subsoil is very friable, yellowish brown fine sandy loam 21 inches thick. The substratum is light olive brown, stratified fine sand and loamy fine sand to a depth of 60 inches or more.

Included with this soil in mapping are areas, generally less than 3 acres each, of Ninigret and Walpole soils that make up about 15 percent of this unit.

The permeability of this soil is moderately rapid or rapid in the subsoil and rapid in the substratum. Available water capacity is moderate. In unlimed areas the soil is medium acid to very strongly acid. The rooting zone extends into the substratum.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or have been planted to trees. Some areas are in residential developments.

This soil is well suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas, and the hazard of erosion is moderate. If this soil is farmed, minimum tillage, use of cover crops, and incorporating grasses and legumes in the cropping system help to reduce runoff and control erosion. Mixing crop residues and manure into the surface layer improves tilth and increases organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable plant species.

This soil is generally suitable for most recreational developments, but slope is a limitation for playgrounds. The soil is suitable for trees and openland and woodland wildlife habitat.

Except for slope, the soil has few limitations for residential development. The soil has few limitations for septic tank absorption fields, but the rapid permeability of the substratum limits use as a site for other waste disposal facilities.

This unit is in capability subclass IIe.

AgC—Agawam fine sandy loam, 8 to 15 percent slopes. This deep, moderately sloping, well drained soil is on the edges of outwash plains and stream terraces. Slopes are smooth, rolling, and mainly 100 to 400 feet long. Some areas are elongated, and some are irregular in shape. The areas range from 5 to 30 acres.

Typically, the surface layer is very friable, very dark grayish brown fine sandy loam about 3 inches thick. The subsoil is very friable, yellowish brown fine sandy loam 24 inches thick. The substratum is light olive brown, stratified fine sand and loamy fine sand to a depth of 60 inches or more.

Included with this soil in mapping are areas of soils that have a surface layer and subsoil of loamy sand and a few small areas of moderately steep or steep soils. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderately rapid or rapid in the subsoil and rapid in the substratum. Available water capacity is moderate. In unlimed areas the soil is medium acid to very strongly acid. The rooting zone extends into the substratum.

Most areas of this soil have been farmed. Many previously cleared areas have reverted to or been planted to trees. Some areas are in residential development.

This soil is suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas, but the erosion hazard is moderately severe. If the soil is farmed, minimum tillage, use of cover crops, and incorporating grasses and legumes in the cropping system help reduce runoff and control erosion. Mixing crop residue and manure into the surface layer improves tilth and increases organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

Slope limits the use of the soil for most types of recreational development other than paths and trails. The soil is generally suitable for trees and openland and woodland wildlife habitat.

Slope limits the use of the soil for residential development, and the rapid permeability of the substratum is the main limitation of the soil as a site for waste disposal facilities.

This unit is in capability subclass IIIe.

AmA—Amostown fine sandy loam, 0 to 3 percent slopes. This deep, nearly level, moderately well drained soil is on old lakebeds and deltas. Slopes are smooth and are 100 to 500 feet long. The areas are irregular in shape and range from 4 to 30 acres.

Typically, the surface layer is very friable, dark grayish brown fine sandy loam about 11 inches thick. The subsoil is very friable fine sandy loam that is yellowish brown in the upper 13 inches and mottled, light olive brown in the lower 14 inches. The substratum is friable, mottled, light olive brown silt loam to a depth of 60 inches or more.

Included with this soil in mapping are areas, mainly smaller than 4 acres, of Walpole Variant soils and areas of well drained soils. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and moderate to slow in the substratum. Available water capacity is moderate. Reaction in the subsoil is strongly acid or very strongly acid. This soil has a seasonal high water table at a depth of less than 30 inches during the winter and early spring.

Most areas of this soil have been farmed. Some of these areas have reverted to woodland, and some areas are in residential development.

This soil is well suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas, and the erosion hazard is slight. Wetness is the major management concern, and subsurface drains are needed in places. Mixing crop residue and manure into the surface layer improves tilth and increases organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation helps maintain desirable pasture plant species.

Wetness is a limitation for playgrounds, but the soil is generally suitable for most other types of recreational development. The soil is also suitable for trees and openland and woodland wildlife habitat.

Wetness, seepage, and susceptibility to frost action limit the use of the soil for residential development and for most types of waste disposal facilities.

This unit is in capability subclass IIw.

AmB—Amostown fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, moderately well drained soil is on old lakebeds and deltas. Slopes are smooth, undulating, and 100 to 500 feet long. The areas are irregular in shape and range from 4 to 30 acres.

Typically, the surface layer is very friable, dark grayish brown fine sandy loam about 11 inches thick. The subsoil is very friable fine sandy loam that is yellowish brown in the upper 13 inches and mottled, light olive brown in the lower 14 inches. The substratum is friable, mottled, light olive brown silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Walpole Variant soils and well drained soils. Included soils make up about 30 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and moderate to slow in the substratum. Available water capacity is moderate. Reaction in the subsoil is strongly acid or very strongly acid. This soil has a seasonal high water table at a depth of less than 30 inches during the winter and early spring.

Most areas of this soil have been farmed. Some of these areas have reverted to woodland, and some are in residential developments.

This soil is well suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas, and the erosion hazard is moderate. Wetness is the major management concern, and subsurface drains are needed in places. If this soil is farmed, minimum tillage, use of cover crops, and incorporating grasses and legumes in the cropping system help to reduce runoff and control erosion. Mixing crop residue and manure into the surface layer improves tilth and increases organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

Slope and wetness are limitations for playgrounds, but the soil is generally suitable for most other types of recreational development. The soil is also suitable for trees and openland and woodland wildlife habitat.

Wetness, seepage, and susceptibility to frost action limit the use of the soil for residential development and for most types of waste disposal facilities.

This unit is in capability subclass IIw.

Ba—Beaches. This unit consists of areas of quartz sand, gravel, and cobblestones that are adjacent to the seashore. Most areas have a zone of erosion from which sand is being removed and a zone of accumulation where sand is deposited by waves, longshore currents, and wind.

This unit is typically adjacent to areas of Udipsamments, Ipswich, and Westbrook soils that are partly covered by water during high tides or storms (fig. 9).

Beaches are mainly used for recreation and are unsuitable for most other purposes.

This unit is not assigned to a capability subclass.

BeA—Belgrade very fine sandy loam, 0 to 3 percent slopes. This deep, nearly level, moderately well drained soil is in stream valleys. Slopes are smooth and are 100 to 500 feet long. The areas are irregular in shape and range from 5 to 40 acres.

Typically, the surface layer is very friable, very dark grayish brown very fine sandy loam about 9 inches thick. The subsoil is very friable very fine sandy loam 21 inches thick. It is yellowish brown in the upper part and mottled, light olive brown in the lower part. The substratum extends to a depth of 60 inches or more. It is mottled, light olive brown very fine sandy loam to a depth of 42 inches and mottled, gray loamy very fine sand at a depth of more than 42 inches.

Included with this soil in mapping are small areas of Unadilla and Raynham soils that make up about 20 percent of this map unit.

The permeability of this soil is moderate in the subsoil and slow to moderate in the substratum. Available water

Figure 9.—An area of Beaches and Udipsamments.

capacity is high, and reaction ranges from strongly acid to neutral. The rooting zone extends into the substratum, but root growth is restricted by a seasonal high water table which is at a depth of less than 42 inches in spring and winter.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some areas are still farmed, and many areas are in residential and urban development.

This soil is well suited to cultivated crops, hay, and pasture. The erosion hazard is slight. The main management concern is wetness caused by the seasonal high water table. Wet spots in the soil need drainage, and farming operations must be timely. If this soil is farmed, minimum tillage helps reduce soil compaction. Use of cover crops and grasses and legumes in the cropping system and mixing crop residue and manure into the surface layer increase organic matter content and improve tilth.

The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species. Keeping livestock off pastures when this soil is saturated helps prevent damage to the sod.

The soil is generally suitable for most recreational developments and for trees and openland and woodland wildlife habitat, but the seasonal high water table limits use for playgrounds, residential development, and waste disposal facilities.

This unit is in capability subclass IIw.

BeB—Belgrade very fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, moderately well drained soil is in stream valleys. Slopes are smooth, undulating, and 100 to 400 feet long. The areas are irregular in shape and range from 5 to 40 acres.

Typically, the surface layer is very friable, very dark grayish brown very fine sandy loam about 9 inches thick. The subsoil is very friable very fine sandy loam 21 inches thick. It is yellowish brown in the upper part and mottled, light olive brown in the lower part. The substratum extends to a depth of 60 inches or more. It is

mottled, light olive brown very fine sandy loam to a depth of 42 inches and mottled, gray loamy very fine sand at a depth of more than 42 inches.

Included with this soil in mapping are small areas of Unadilla and Raynham soils that make up about 20 percent of this map unit.

The permeability of this soil is moderate in the subsoil and slow to moderate in the substratum. Available water capacity is high, and reaction ranges from strongly acid to neutral. The rooting zone extends into the substratum, but root growth is restricted by a seasonal high water table which is at a depth of less than 42 inches in the spring and winter.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some areas are farmed, and many areas are in residential and urban developments.

This soil is well suited to cultivated crops, hay, and pasture. The erosion hazard is moderate. The main management concern is wetness caused by the seasonal high water table. Wet spots in the soil need drainage, and farming operations must be timely. Minimum tillage helps reduce soil compaction. Use of cover crops and grasses and legumes in the cropping system helps to reduce runoff and control erosion. Mixing crop residue and manure into the surface layer improves tilth and increases organic matter content.

The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species. Keeping livestock off the pasture when this soil is saturated helps prevent damage to the sod.

The soil is generally suitable for most recreational developments and for trees and openland and woodland wildlife habitat, but slope and wetness limit use for playgrounds and wetness is a limitation for residential development and waste disposal facilities.

This unit is in capability subclass IIw.

BeC—Belgrade very fine sandy loam, 8 to 15 percent slopes. This deep, moderately sloping, moderately well drained soil is in stream valleys. Slopes are smooth, or rolling, and 100 to 300 feet long. The areas are elongated or irregular in shape and range from 5 to 30 acres.

Typically, the surface layer is very friable, very dark grayish brown very fine sandy loam about 9 inches thick. The subsoil is very friable very fine sandy loam 21 inches thick. It is yellowish brown in the upper part and mottled, light olive brown in the lower part. The substratum extends to a depth of 60 inches or more. It is mottled, light olive brown very fine sandy loam to a depth of 42 inches and mottled, gray loamy very fine sand at a depth of more than 42 inches.

Included with this soil in mapping are small areas of Unadilla and Raynham soils that make up about 15 percent of this map unit.

The permeability of this soil is moderate in the subsoil and slow to moderate in the substratum. Available water capacity is high, and reaction ranges from strongly acid to neutral. The rooting zone extends into the substratum, but root growth is restricted by a seasonal high water table which is at a depth of less than 42 inches in the spring and winter.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some areas are still farmed, and many areas are in residential and urban development.

This soil is suited to cultivated crops but is better suited to hay and pasture. Slope, wetness, and a moderately severe erosion hazard are the main limitations for farming. Drainage of wet spots is needed. If this soil is farmed, minimum tillage and the use of cover crops and grasses and legumes in the cropping system help to reduce runoff and control erosion. Mixing crop residue and manure into the surface layer improves tilth and increases organic matter content.

The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species. Keeping livestock off the pasture when this soil is saturated helps prevent damage to the sod.

The soil is generally suitable for paths and trails, but slope is a limitation for most other recreational developments. The soil is also suitable for trees and openland and woodland wildlife habitat.

The seasonal high water table and a susceptibility to frost action limit use of the soil for residential development. The seasonal high water table also limits use for waste disposal facilities.

This unit is in capability subclass IIIe.

Br—Birdsall silt loam. This deep, nearly level, very poorly drained soil is in low areas and depressions near large streams. Slopes are 100 to 400 feet long. Some areas are elongated, and some are irregular in shape. The areas range from 5 to 15 acres.

Typically, the surface layer is friable, black silt loam about 8 inches thick. The subsoil is mottled, friable, dark grayish brown very fine sandy loam 17 inches thick. The substratum is firm, gray silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Raynham and Maybid soils and Medisaprists, shallow, that make up about 15 percent of this map unit.

The permeability of this soil is moderately slow in the subsoil and slow in the substratum. Available water capacity is high. Reaction ranges from strongly acid through neutral in the subsoil and substratum. The rooting zone extends to a few inches below the surface layer. Root growth is restricted by a seasonal high water table which is at or near the surface in fall, winter, and spring.

Most areas of this soil are in woodland. Many areas are idle farmland. The seasonal high water table limits

use of the soil for most purposes except as wetland wildlife habitat. The slow permeability in the substratum hinders the use of artificial drainage.

This unit is in capability subclass VIw.

BuA—Buxton silt loam, 0 to 3 percent slopes. This deep, nearly level, moderately well drained soil is in the larger valleys of the survey area. Slopes are smooth, gently undulating, and 100 to 400 feet long. The areas are irregular in shape and range from 3 to 15 acres.

Typically, the surface layer is friable, very dark grayish brown silt loam about 10 inches thick. The subsoil is 20 inches thick. The upper 12 inches is friable, yellowish brown and light olive brown silt loam; the lower 8 inches is firm, light yellowish brown, mottled silty clay loam. The substratum is firm, light yellowish brown, mottled silty clay to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Suffield and Scantic soils that make up about 15 percent of this map unit.

The permeability of this soil is moderately slow in the subsoil and slow in the substratum. Available water capacity is high. Reaction is strongly acid to slightly acid in the subsoil and medium acid to neutral in the substratum. The rooting zone extends through the subsoil, but root growth is restricted by a seasonal high water table in the lower part of the subsoil in winter and spring.

Most areas of this soil have been farmed. Some of the previously cleared areas have reverted to or been planted to trees. Some of the areas are still farmed, and some are in residential and urban development.

This soil is well suited to cultivated crops, hay, and pasture. Wetness is the major management concern. Good tilth is easily maintained in cultivated areas, and the erosion hazard is slight. Use of cover crops and grasses and legumes in the cropping system and mixing crop residue and manure into the surface layer improve tilth and increase the organic matter content of the soil.

Use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species. Keeping livestock off the pasture when the soil is wet helps prevent damage to the sod.

The soil is generally suitable for paths and trails, trees, and openland and woodland wildlife habitat. The seasonal high water table, however, limits the soil for most other uses, and the slow permeability of the substratum is a limitation for waste disposal facilities.

This unit is in capability subclass IIw.

BuB—Buxton silt loam, 3 to 8 percent slopes. This deep, gently sloping, moderately well drained soil is in the larger valleys in the survey area. Slopes are smooth, undulating, and 100 to 600 feet long. The areas are irregular in shape and range from 5 to 20 acres.

Typically, the surface layer is friable, very dark grayish brown silt loam about 10 inches thick. The subsoil is 20 inches thick. It is friable, light olive brown silt loam in the upper 12 inches and mottled, firm, light olive brown silty clay loam in the lower 8 inches. The substratum is mottled, firm, light yellowish brown silty clay to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Suffield and Scantic soils and a few areas of soils with rock outcrops 100 to 300 feet apart. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderately slow in the subsoil and slow in the substratum. Available water capacity is high. Reaction is strongly acid to slightly acid in the subsoil and medium acid to neutral in the substratum. The rooting zone extends through the subsoil, but root growth is restricted by a seasonal high water table in the lower part of the subsoil in winter and spring.

Most areas of this soil have been farmed. Some of the previously cleared areas have reverted to or been planted to trees. Some of the areas are still farmed, and some are in residential and urban development.

This soil is well suited to cultivated crops, hay, and pasture. Wetness and erosion are the main limitations. Installing surface drains helps to control wetness, and minimum tillage and use of cover crops reduce runoff and help control erosion. Using grasses and legumes in the cropping system and mixing crop residue and manure into the surface layer improve tilth and increase organic matter content of the soil.

Use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species. Keeping livestock off the pasture when the soil is wet prevents damage to the sod.

The soil is generally suitable for paths and trails, trees, and openland and woodland wildlife habitat. However, the seasonal high water table in the subsoil and slow permeability of substratum limit the soil for most other nonfarm uses.

This unit is in capability subclass IIw.

BuC—Buxton silt loam, 8 to 15 percent slopes. This deep, moderately sloping, moderately well drained soil is in the larger valleys of the survey area. Slopes are smooth, rolling, and 50 to 500 feet long. The areas are irregular in shape and range from 5 to 15 acres.

Typically, the surface layer is friable, very dark grayish brown silt loam about 10 inches thick. The subsoil is 17 inches thick. It is friable, light olive brown silt loam in the upper 10 inches and mottled, firm, light yellowish brown silty clay loam in the lower 7 inches. The substratum is mottled, firm, light yellowish brown silty clay to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Suffield and Scantic soils. Also included are areas of soils with bedrock exposures 100 to 300 feet apart. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderately slow in the subsoil and slow in the substratum. Available water capacity is high. Reaction is strongly acid to slightly acid in

the subsoil and medium acid to neutral in the substratum. The rooting zone extends through the subsoil, but root growth is restricted by a seasonal high water table in the lower part of the subsoil in winter and spring.

Most areas of this soil have been farmed. Some of the previously cleared areas have reverted to or been planted to trees. Some areas are still farmed, and some are in residential developments.

This soil is suited to cultivated crops and is well suited to hay and pasture. Controlling erosion and wetness is the main management concern. Installing drainage systems helps control wetness; farming on the contour and using cover crops and grasses and legumes in the cropping system help reduce runoff and control erosion. Mixing crop residue and manure into the surface layer improves tilth and increases organic matter content of the soil.

Use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species. Keeping livestock off the pasture when the soil is wet prevents damage to the sod.

This soil is generally suitable for paths and trails, trees, and openland and woodland wildlife habitat. However, slow permeability, slope, and the seasonal high water table limit the soil for most other nonfarm uses.

This unit is in capability subclass IIIe.

BxB—Buxton-Rock outcrop complex, 3 to 8 percent slopes. This complex is in the larger valleys in the survey area. It consists of deep, moderately well drained Buxton soils and bedrock exposures 100 to 300 feet apart. Slopes are complex and mainly 100 to 500 feet long. The areas are irregular in shape and range from 5 to 50 acres. They consist of approximately 70 percent Buxton soils, 15 percent Rock outcrop, and 15 percent other soils. The soils and Rock outcrop are so intermingled that it was not practical to map them separately.

Typically the Buxton soils have a surface layer of friable, very dark grayish brown silt loam about 10 inches thick. The subsoil is 20 inches thick. It is friable, light olive brown silt loam in the upper 12 inches and mottled, firm, light yellowish brown silty clay loam in the lower 8 inches. The substratum is firm, light yellowish brown, mottled silty clay to a depth of 60 inches or more.

Included with this complex in mapping are small areas of Suffield and Scantic soils.

The permeability of the Buxton soils is moderately slow in the subsoil and slow in the substratum. Available water capacity is high. Reaction is strongly acid to slightly acid in the subsoil and medium acid to neutral in the substratum. The rooting zone extends through the subsoil, but root growth is restricted by a seasonal high water table in the lower part of the subsoil during winter and spring.

Most areas of this complex have been farmed. Some of the previously cleared areas have reverted to trees. Some areas are still farmed, and some are in residential and urban development.

This complex is poorly suited to cultivated crops and to hay and pasture. The bedrock exposures interfere with the use of machinery, and wetness and erosion are major limitations. Installing surface drains where feasible helps control wetness, and minimum tillage and the use of cover crops reduce runoff and help control erosion.

The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species. Keeping livestock off the pasture when the soil is wet prevents damage to the sod.

This complex is generally suitable for paths and trails, trees, and openland and woodland wildlife habitat. However, the seasonal high water table, slow permeability of the substratum, and bedrock exposures limit the complex for most other nonfarm uses.

This unit is in capability subclass VIs.

BxC—Buxton-Rock outcrop complex, 8 to 15 percent slopes. This complex is in the larger valleys in the survey area. It consists of deep, moderately well drained Buxton soils and bedrock exposures 100 to 300 feet apart. Slopes are complex and mainly 100 to 400 feet long. The areas are irregular in shape and range from 5 to 40 acres. They consist of approximately 70 percent Buxton soils, 15 percent Rock outcrop, and 15 percent other soils. The soils and Rock outcrop are so intermingled that it was not practical to map them separately.

Typically, the Buxton soils have a surface layer of friable, very dark grayish brown silt loam about 10 inches thick. The subsoil is 20 inches thick. It is friable, light olive brown silt loam in the upper 12 inches and mottled, firm, light yellowish brown silty clay loam in the lower 8 inches. The substratum is firm, light yellowish brown, mottled silty clay to a depth of 60 inches or more.

Included with this complex in mapping are small areas of Suffield and Scantic soils.

Permeability in the Buxton soils is moderately slow in the subsoil and slow in the substratum. Available water capacity is high. Reaction is strongly acid to slightly acid in the subsoil and medium acid to neutral in the substratum. The rooting zone extends through the subsoil, but root growth is restricted by a seasonal high water table in the lower part of the subsoil during winter and spring.

Most areas of this complex have been farmed. Some of the previously cleared areas have reverted to trees. Some of the areas still are farmed, and some are in residential developments.

This complex is poorly suited to cultivated crops and to hay and pasture. The bedrock exposures interfere with the use of machinery. Wetness and erosion are major limitations. Installing surface drains where feasible helps control wetness, and minimum tillage and the use of cover crops reduce runoff and help control erosion.

The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture

plant species. Keeping livestock off the pasture when the soil is wet prevents damage to the sod.

This complex is generally suitable for paths and trails, but the slow permeability in the substratum, the seasonal high water table, and bedrock exposures limit the soil for most other nonfarm uses.

This unit is in capability subclass VIs.

CaA—Canton fine sandy loam, 0 to 3 percent slopes. This deep, nearly level, well drained soil is mostly in rectangular areas on the lower slopes of hills throughout the survey area. The areas range from 3 to 15 acres. Slopes are generally smooth and are 100 to 400 feet long.

Typically, the surface layer is very friable dark brown fine sandy loam about 7 inches thick. The subsoil is very friable fine sandy loam 26 inches thick. It is brown in the upper 9 inches, yellowish brown in the next 11 inches, and light olive brown in the lower 6 inches. The substratum is loose, light brownish gray gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Scituate soils and Medisaprists, shallow, that make up about 20 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and rapid in the substratum. Available water capacity is moderate, and reaction ranges from extremely acid to strongly acid. The rooting zone extends into the substratum.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some of the acreage still is farmed, and many areas are in urban and residential developments.

This soil is well suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas by mixing crop residue and manure into the surface layer. The erosion hazard is slight. The main management concerns are improving tilth and increasing fertility and organic matter content of this soil. Use of cover crops and grasses and legumes in the cropping system increases the organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is generally suitable for recreational development, but small stones on the surface are a limitation for playgrounds. The soil is poorly suited to timber production. It is suitable for openland and woodland wildlife habitat.

This soil has few limitations for residential development and septic tank absorption fields. However, the sides of shallow excavations in this soil are unstable, and use for some types of waste disposal facilities is limited by rapid permeability in the substratum.

This unit is in capability class I.

CaB—Canton fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, well drained soil is mostly in rectangular or irregularly shaped areas on the lower slopes of hills throughout the survey area. The areas range from 5 to 25 acres. Slopes are smooth, undulating, and 50 to 300 feet long.

Typically, the surface layer is very friable, dark brown fine sandy loam about 7 inches thick. The subsoil is very friable fine sandy loam 26 inches thick. It is brown in the upper 9 inches, yellowish brown in the next 11 inches, and light olive brown in the lower 6 inches. The substratum is loose, light brownish gray gravelly loamy sand to a depth of 60 inches of more.

Included with this soil in mapping are small areas of Scituate soils and Medisaprists, shallow, and a few small areas of soils with a surface layer and subsoil of silt loam. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and rapid in the substratum. Available water capacity is moderate, and reaction ranges from extremely acid to strongly acid. The rooting zone extends into the substratum.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some of the acreage still is farmed, and many areas are in urban and residential development.

This soil is well suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas by mixing crop residue and manure into the surface layer. The erosion hazard is moderate. If this soil is farmed, minimum tillage and the use of cover crops and grasses and legumes in the cropping system reduce runoff and control erosion. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for most types of recreational development and for openland and woodland wildlife habitat. It is poorly suited to timber production.

This soil has few limitations for residential development and septic tank absorption fields. However, the sides of shallow excavations in this soil are unstable, and the rapid permeability of the substratum limits use for some types of waste disposal facilities.

This unit is in capability subclass IIe.

CaC—Canton fine sandy loam, 8 to 15 percent slopes. This deep, moderately sloping, well drained soil is in rectangular or irregularly shaped areas on the lower slopes of hills throughout the survey area. The areas range from 5 to 30 acres. Slopes are smooth, rolling, and 50 to 500 feet long.

Typically, the surface layer is very friable, dark brown fine sandy loam about 7 inches thick. The subsoil is very friable fine sandy loam 24 inches thick. It is brown in the upper 9 inches, yellowish brown in the next 9 inches, and light olive brown in the lower 6 inches. The substratum is loose, light brownish gray gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Scituate soils and Medisaprists, shallow, and soils with a surface layer of silt loam. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and rapid in the substratum. Available water capacity is moderate, and reaction ranges from extremely acid to strongly acid. The rooting zone extends into the substratum.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some of the acreage still is farmed, and many areas are in urban and residential development.

This soil is suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas. The erosion hazard is moderately severe. If this soil is farmed, minimum tillage and the use of cover crops and grasses and legumes in the cropping system help to reduce runoff and control erosion. Mixing crop residue and manure into the surface layer improves tilth and increases organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for openland and woodland wildlife habitat. It is poorly suited to timber production. Slope, the instability of the sides of excavations in this soil, and the rapid permeability of the substratum limit the soil for most other nonfarm uses.

This unit is in capability subclass IIIe.

CaD—Canton fine sandy loam, 15 to 25 percent slopes. This deep, moderately steep, well drained soil is in irregularly shaped areas on the lower slopes of hills throughout the survey area. The areas range from 5 to 30 acres. Slopes are 50 to 500 feet long.

Typically, the surface layer is very friable, dark brown fine sandy loam about 5 inches thick. The subsoil is very friable fine sandy loam 22 inches thick. It is brown in the upper 8 inches, yellowish brown in the next 8 inches, and light olive brown in the lower 6 inches. The substratum is loose, light brownish gray gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Charlton soils and Medisaprists, shallow. Inclusions make up about 15 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and rapid in the substratum. Available water capacity is moderate, and reaction ranges from extremely acid to strongly acid. The rooting zone extends into the substratum.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some of the acreage still is farmed, and some is in urban and residential development.

This soil is suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas. The erosion hazard is severe, and controlling erosion is a major management concern. Where this soil is farmed, minimum tillage and the use of cover crops and grasses and legumes in the cropping system help to reduce runoff and control erosion. Mixing crop residue and manure into the surface layer improves tilth and increases organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for woodland wildlife habitat but is poorly suited to timber production. Slope is the main limitation for most other nonfarm uses. The sides of shallow excavations in this soil are unstable, and rapid permeability in the substratum limits use for sanitary landfills.

This unit is in capability subclass IVe.

CbB—Canton very stony fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, well drained soil is in irregularly shaped areas on the lower slopes of hills throughout the survey area. The areas range from 10 to 150 acres. Slopes are smooth, undulating, and 50 to 800 feet long. The surface of the soil has stones 1 to 3 feet in diameter that are 30 to 100 feet apart.

Typically, the surface layer is very friable, dark brown fine sandy loam about 6 inches thick. The subsoil is very friable fine sandy loam 27 inches thick. It is brown in the upper 10 inches, yellowish brown in the next 11 inches, and light olive brown in the lower 6 inches. The substratum is loose, light brownish gray gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Scituate soils and Medisaprists, shallow, and soils with a surface layer and subsoil of silt loam. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and rapid in the substratum. Available water capacity is moderate, and reaction ranges from extremely acid to strongly acid. The rooting zone extends into the substratum.

A few areas of this soil are farmed and are mainly used for pasture. Some areas are wooded, and many are in urban and residential development (fig. 10).

The stones on the surface make this soil poorly suited to cultivated crops. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The stony surface also limits the soil for most recreational uses other than picnic areas. The soil is suitable for woodland wildlife habitat but is poorly suited to timber production. The slope, stones on the surface, instability of the sides of excavations in the soil, and the rapid permeability of the substratum limit the soil for most other nonfarm uses.

This unit is in capability subclass VIs.

CbC—Canton very stony fine sandy loam, 8 to 15 percent slopes. This deep, moderately sloping, well drained soil is in irregularly shaped areas on the lower

Figure 10.—An area of very stony Canton soils used for residential development.

slopes of hills throughout the survey area. The areas range from 10 to 100 acres. Slopes are smooth, rolling, and 50 to 600 feet long. The surface is covered by stones 1 to 3 feet in diameter that are 30 to 100 feet apart.

Typically, the surface layer is very friable, dark brown fine sandy loam about 6 inches thick. The subsoil is very friable fine sandy loam 27 inches thick. It is brown in the upper 10 inches, yellowish brown in the next 11 inches, and light olive brown in the lower 6 inches. The substratum is loose, light brownish gray gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Scituate soils and Medisaprists, shallow, and soils with a surface layer and subsoil of silt loam. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and rapid in the substratum. Available water capacity is moderate, and reaction ranges from extremely acid to strongly acid. The rooting zone extends into the substratum.

A few areas of this soil are farmed and are mainly used for pasture. Many areas are wooded, and many are in urban and residential development.

The stones on the surface make this soil poorly suited to cultivated crops. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for woodland wildlife habitat but is poorly suited to timber production. Slope, the stony surface, the instability of the sides of shallow excavations, and the rapid permeability of the substratum limit this soil for most other nonfarm uses.

This unit is in capability subclass VIs.

CbD—Canton very stony fine sandy loam, 15 to 25 percent slopes. This deep, moderately steep, well drained soil is in irregularly shaped areas on the lower slopes of hills throughout the survey area. The areas range from 10 to 60 acres. Slopes are 50 to 400 feet

long. The surface of the soil is covered by stones 1 to 3 feet in diameter that are 30 to 100 feet apart.

Typically, the surface layer is very friable, dark brown fine sandy loam about 6 inches thick. The subsoil is very friable fine sandy loam 27 inches thick. It is brown in the upper 10 inches, yellowish brown in the next 11 inches, and light olive brown in the lower 6 inches. The substratum is loose, light brownish gray gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Scituate and Charlton soils and soils with a surface layer and subsoil of silt loam. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and rapid in the substratum. Available water capacity is moderate, and reaction ranges from extremely acid to strongly acid. The rooting zone extends into the substratum.

Many areas of this soil are in woodland. A few areas are farmed and mainly used for pasture.

Slope and the stones on the surface make this soil poorly suited to cultivated crops. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

The soil is suitable for woodland wildlife habitat but is poorly suited to timber production. Slope limits the use of equipment. Slope, the stony surface, the instability of sides of shallow excavations in this soil, and the rapid permeability in the substratum limit the soil for most other nonfarm uses.

This unit is in capability subclass VIs.

CcB—Canton extremely stony fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, well drained soil is in irregularly shaped areas on the lower slopes of hills throughout the survey area. The areas range from 10 to 150 acres. Slopes are smooth, undulating, and 100 to 800 feet long. The surface is covered by stones 1 to 3 feet in diameter that are 10 to 30 feet apart.

Typically, the surface layer is very friable, dark brown fine sandy loam about 3 inches thick. The subsoil is very friable fine sandy loam 30 inches thick. It is brown in the upper 12 inches, yellowish brown in the next 12 inches, and light olive brown in the lower 6 inches. The substratum is loose, light brownish gray gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Scituate soils and Medisaprists, shallow, that make up about 20 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and rapid in the substratum. Available water capacity is moderate, and reaction ranges from extremely acid to strongly acid. The rooting zone extends into the substratum.

Most areas of this soil are in woodland. A few areas are in urban and residential development.

The stones on the surface make this soil poorly suited for most uses other than woodland wildlife habitat. The sides of shallow excavations in the soil are unstable, and the rapid permeability of the substratum limits use for waste disposal facilities.

This unit is in capability subclass VIIs.

CcC—Canton extremely stony fine sandy loam, 8 to 15 percent slopes. This deep, moderately sloping, well drained soil is in irregularly shaped areas on the lower slopes of hills throughout the survey area. The areas range from 10 to 100 acres. Slopes are smooth, rolling, and 50 to 800 feet long. The surface is covered by stones 1 to 3 feet in diameter that are 10 to 30 feet apart.

Typically, the surface layer is very friable, dark brown fine sandy loam about 3 inches thick. The subsoil is very friable fine sandy loam 30 inches thick. It is brown in the upper 12 inches, yellowish brown in the next 12 inches, and light olive brown in the lower 6 inches. The substratum is loose, light brownish gray gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Scituate soils that make up about 15 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and rapid in the substratum. Available water capacity is moderate, and reaction ranges from extremely acid to strongly acid. The rooting zone extends into the substratum.

Most areas of this soil are in woodland. A few areas are in residential development.

The stones on the surface make this soil poorly suited to most uses other than woodland wildlife habitat. The sides of shallow excavations in the soil are unstable, and the rapid permeability in the substratum limits use for waste disposal facilities.

This unit is in capability subclass VIIs.

CcD—Canton extremely stony fine sandy loam, 15 to 25 percent slopes. This deep, moderately steep, well drained soil is in irregularly shaped areas on the lower slopes of hills throughout the survey area. The areas range from 10 to 75 acres. Slopes are 50 to 600 feet long. The surface is covered by stones 1 to 3 feet in diameter that are 10 to 30 feet apart.

Typically, the surface layer is very friable, dark brown fine sandy loam about 3 inches thick. The subsoil is very friable fine sandy loam 25 inches thick. It is brown in the upper 10 inches, yellowish brown in the next 10 inches, and light olive brown in the lower 5 inches. The substratum is loose, light brownish gray gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Scituate and Charlton soils that make up about 15 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and rapid in the substratum. Available water capacity is moderate, and reaction ranges from extremely acid to strongly acid. The rooting zone extends into the substratum.

Most areas of this soil are in woodland, but the soil is poorly suited to timber production. It is suitable, however, for woodland wildlife habitat. The surface stones and slope limit use of timber harvesting equipment.

Slope and the stony surface make the soil poorly suited to most other uses. The sides of shallow excavations in the soil are unstable, and the rapid permeability in the substratum and the susceptibility to seepage limit use for waste disposal facilities.

This unit is in capability subclass VIIs.

CDE—Canton and Charlton extremely stony fine sandy loams, steep. These deep, steep, well drained soils are on the sides of hills and ridges. The areas are irregular in shape and range from 10 to 40 acres. Slopes are smooth and are 200 to 500 feet long. The surface is covered by stones 1 to 3 feet in diameter that are 10 to 30 feet apart. Some areas of this unit are dominantly Canton soils, some are dominantly Charlton soils, and some are both. The soils are mapped together because their use and management is about the same. The mapped acreage of this unit is about 60 percent Canton soils, 20 percent Charlton soils, and 20 percent other soils.

Typically, the Canton soils have a surface layer of very friable, dark brown fine sandy loam about 3 inches thick. The subsoil is very friable fine sandy loam 22 inches thick. It is brown in the upper 10 inches, yellowish brown in the next 9 inches, and light olive brown in the lower 3 inches. The substratum is loose, light brownish gray gravelly loamy sand to a depth of 60 inches or more.

Typically, the Charlton soils have a surface layer of very friable, dark brown fine sandy loam about 4 inches thick. The subsoil is friable fine sandy loam 24 inches thick. It is dark brown in the upper 7 inches and dark yellowish brown in the lower 17 inches. The substratum is friable, olive brown gravelly fine sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of Hollis, Paxton, and Woodbridge soils that make up about 20 percent of this unit.

Permeability is moderately rapid in the subsoil and rapid in the substratum of the Canton soils. It is moderate to moderately rapid throughout the Charlton soils. Available water capacity is moderate in both. Reaction ranges from extremely acid to strongly acid in the Canton soils, and from very strongly acid to medium acid in the Charlton soils. The rooting zone extends into the substratum in both soils, but root growth is restricted by the lack of water in the substratum of the Canton soils.

Most areas of this unit are in woodland, but the soils are poorly suited to timber production. The use of timber harvesting equipment is limited by slope and the stones on the surface. Slope and the stony surface also limit the soils for most other uses except woodland wildlife habitat.

This unit is in capability subclass VIIs.

CeA—Carver loamy coarse sand, 0 to 3 percent slopes. This deep, nearly level, excessively drained soil is in irregularly shaped areas that range from 5 to 150 acres. Slopes are smooth and are 300 to 1,000 feet long.

Typically, the surface layer is very friable, black loamy coarse sand about 5 inches thick. The subsoil is 29 inches thick. It is dark yellowish brown and yellowish brown loamy coarse sand in the upper 14 inches and yellowish brown coarse sand in the lower 15 inches. The substratum is thin layers of loose, pale brown and light gray coarse sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Deerfield and Wareham soils that make up about 15 percent of this map unit.

The permeability of this soil is very rapid. Available water capacity is very low. In unlimed areas the soil is strongly acid to extremely acid. The rooting zone extends into the substratum.

Most areas of this soil are in woodland. A few areas are farmed, and some are used for residential and urban development.

This soil is suited to cultivated crops, hay, and pasture, but it is droughty. The erosion hazard is slight. The main management needs include irrigation, frequent applications of fertilizer, and cover crops.

A high sand content limits this soil for recreational development. The soil is poorly suited to trees and to wildlife habitat.

The soil is generally suitable for residential development. The sides of shallow excavations are unstable, and establishing lawns is usually difficult because of droughtiness. The soil has few limitations for septic tank filter fields, but the very rapid permeability is a limitation for most other types of waste disposal facilities.

This unit is in capability subclass IVs.

CeB—Carver loamy coarse sand, 3 to 8 percent slopes. This deep, gently sloping, excessively drained soil is in irregularly shaped areas that range from 5 to 25 acres. Slopes are smooth, undulating, and 300 to 1,000 feet long.

Typically, the surface layer is very friable, black loamy coarse sand about 5 inches thick. The subsoil is 29 inches thick and is loose throughout. It is dark yellowish brown and yellowish brown loamy coarse sand in the upper 14 inches and yellowish brown coarse sand in the lower 15 inches. The substratum is thin layers of loose, pale brown and light gray coarse sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Deerfield and Wareham soils that make up about 15 percent of this map unit.

The permeability of this soil is very rapid. Available water capacity is very low. In unlimed areas the soil is strongly acid to extremely acid. The rooting zone extends into the substratum.

Most areas of this soil are in woodland. A few areas are farmed, and some are used for residential and urban development.

This soil is suited to cultivated crops, hay, and pasture, but it is droughty. The erosion hazard is slight. The main management needs include irrigation, frequent applications of fertilizer, and cover crops.

Slope and the sandy texture limit this soil for recreational development. The soil is poorly suited to trees and wildlife habitat.

The soil is generally suitable for residential development. The sides of shallow excavations are unstable. Establishing lawns is usually difficult because of droughtiness. The soil has few limitations for septic tank filter fields, but the very rapid permeability is a limitation for most other types of waste disposal facilities.

This unit is in capability subclass IVs.

CmB—Charlton fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, well drained soil is mostly in rectangular areas on the lower slopes of hills and ridges. The areas range from 5 to 20 acres. Slopes are typically smooth and convex and range from 100 to 400 feet long.

Typically, the surface layer is very friable, dark brown fine sandy loam about 4 inches thick. The subsoil is friable, brown fine sandy loam in the upper 7 inches and friable, dark yellowish brown gravelly fine sandy loam in the lower 17 inches. The substratum is friable, olive brown gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Sutton soils and Charlton soils with slopes of 0 to 3 percent. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderate or moderately rapid, and available water capacity is moderate. Reaction ranges from very strongly acid to medium acid. The rooting zone extends into the substratum.

Most areas of this soil are used for residential development. Some previously cleared areas have reverted to or been planted to trees. Most of the acreage of the soil has been farmed, and some areas still are farmed.

This soil is well suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas. The erosion hazard is moderate. Where this soil is farmed, stripcropping, minimum tillage, and use of cover crops and grasses and legumes in the cropping system help reduce runoff and erosion and increase organic matter content. Use of proper stocking rates and deferred grazing helps maintain desirable pasture plant species.

The soil is generally suitable for recreational and residential development, but slope is a limitation for playgrounds and the moderate or moderately rapid permeability limits use for sanitary landfills. The soil is also suitable for trees and for openland and woodland wildlife habitat.

This unit is in capability subclass IIe.

CmC—Charlton fine sandy loam, 8 to 15 percent slopes. This deep, moderately sloping, well drained soil is mostly in rectangular areas on the lower slopes of hills and ridges. The areas range from 5 to 20 acres. Slopes are typically smooth and convex and are 100 to 400 feet long.

Typically, the surface layer is very friable, dark brown fine sandy loam about 4 inches thick. The subsoil is friable, brown fine sandy loam in the upper 7 inches and friable, dark yellowish brown gravelly fine sandy loam in the lower 17 inches. The substratum is friable, olive brown gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Sutton and Canton soils that make up about 20 percent of this map unit.

The permeability of this soil is moderate or moderately rapid, and available water capacity is moderate. Reaction ranges from very strongly acid to medium acid. The rooting zone extends into the substratum.

Many areas of this soil are in residential development. Some of the previously cleared areas have reverted to or been planted to trees. Most areas of the soil have been farmed, and some areas still are farmed.

This soil is suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas. The erosion hazard is moderately severe. Where this soil is farmed, stripcropping, terracing, minimum tillage, and use of cover crops and grasses and legumes in the cropping system help reduce runoff and erosion and increase organic matter content. Mixing crop residue and manure into the surface layer improves tilth and also increases the organic matter content of this soil. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

Slope limits the soil for most types of recreational and residential development, and the moderate or moderately rapid permeability limits use for most types of waste disposal facilities. The soil is suitable for trees and for openland and woodland wildlife habitat.

This unit is in capability subclass IIIe.

CmD—Charlton fine sandy loam, 15 to 25 percent slopes. This deep, moderately steep, well drained soil is mostly in rectangular and irregularly shaped areas on the lower slopes of hills and ridges. The areas range from 5

to 20 acres. Slopes are typically smooth and convex and are 100 to 400 feet long.

Typically, the surface layer is very friable, dark brown fine sandy loam about 4 inches thick. The subsoil is friable, brown fine sandy loam in the upper 7 inches and friable, dark yellowish brown gravelly fine sandy loam in the lower 17 inches. The substratum is friable, olive brown gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Sutton and Canton soils that make up about 20 percent of this map unit.

The permeability of this soil is moderate or moderately rapid, and available water capacity is moderate. Reaction ranges from very strongly acid to medium acid. The rooting zone extends into the substratum.

Some of the previously cleared areas of this soil have reverted to or been planted to trees, and some are in residential development. Most areas of the soil have been farmed, and a few areas still are farmed.

This soil is suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas. The erosion hazard is moderately severe. Where this soil is farmed, stripcropping, terracing, minimum tillage, and use of cover crops and grasses and legumes in the cropping system help reduce runoff and erosion and increase organic matter content. Mixing crop residue and manure into the surface layer improves tilth and also increases the organic matter content of this soil. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

Slope limits use of the soil for most types of recreational and residential development and for most waste disposal facilities. The moderate or moderately rapid permeability is also a limitation for waste disposal facilities. The soil is suitable for trees and woodland wildlife habitat.

This unit is in capability subclass IVe.

CoB—Charlton very stony fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, well drained soil is in irregularly shaped areas on lower slopes of hills and ridges. The areas range from 15 to 100 acres and are covered by stones 1 to 3 feet in diameter that are 30 to 100 feet apart. Slopes are typically smooth and convex and are 100 to 600 feet long.

Typically, the surface layer is very friable, dark brown fine sandy loam about 4 inches thick. The subsoil is friable, brown fine sandy loam in the upper 7 inches and friable, dark yellowish brown gravelly fine sandy loam in the lower 17 inches. The substratum is friable, olive brown gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Sutton soils and areas with stones 10 to 30 feet apart on the surface. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderate or moderately rapid, and available water capacity is moderate. Reaction ranges from very strongly acid to medium acid. The rooting zone extends into the substratum.

Most areas of this soil are in woodland, and a few are used for pasture. Some areas are in residential development.

The stones on the surface make this soil poorly suited to cultivated crops. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The stones on the surface limit the soil for most types of recreational and residential development except for picnic areas. The moderate or moderately rapid permeability limits use of the soil for most types of waste disposal facilities. The soil is suitable for trees and woodland wildlife habitat.

This unit is in capability subclass VIs.

CoC—Charlton very stony fine sandy loam, 8 to 15 percent slopes. This deep, moderately sloping, well drained soil is in irregularly shaped areas on lower slopes of hills and ridges. The areas range from 20 to 100 acres. Slopes are smooth and convex and are 200 to 500 feet long. The surface is covered by stones 1 to 3 feet in diameter that are 30 to 100 feet apart.

Typically, the surface layer is very friable, dark brown fine sandy loam about 4 inches thick. The subsoil is friable, brown fine sandy loam in the upper 7 inches and friable, dark yellowish brown gravelly fine sandy loam in the lower 15 inches. The substratum is friable, olive brown gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Sutton and Canton soils and areas with stones 10 to 30 feet apart on the surface. Included areas make up about 20 percent of this map unit.

The permeability of this soil is moderate or moderately rapid, and available water capacity is moderate. Reaction ranges from very strongly acid to medium acid. The rooting zone extends into the substratum.

Most areas of this soil are in woodland. A few areas are used for pasture, and some are in residential development.

Slope and the stones on the surface limit the soil for cultivated crops and for recreational and residential development. The moderate or moderately rapid permeability limits use of the soil as a site for waste disposal facilities. In areas used for pasture the use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable plant species.

The soil is suitable for trees and woodland wildlife habitat.

This unit is in capability subclass VIs.

CoD—Charlton very stony fine sandy loam, 15 to 25 percent slopes. This deep, moderately steep, well

drained soil is in irregularly shaped areas on lower slopes of hills and ridges. The areas range from 20 to 50 acres. Slopes are smooth and convex and are typically 100 to 500 feet long. The surface is covered by stones 1 to 3 feet in diameter that are 30 to 100 feet apart.

Typically, the surface layer is very friable, dark brown fine sandy loam about 3 inches thick. The subsoil is friable, brown fine sandy loam in the upper 6 inches and friable, dark yellowish brown gravelly fine sandy loam in the lower 13 inches. The substratum is friable, olive brown gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Sutton and Canton soils and a few areas with stones 10 to 30 feet apart on the surface. Included areas make up about 20 percent of this map unit.

The permeability of this soil is moderate or moderately rapid, and available water capacity is moderate. Reaction ranges from very strongly acid to medium acid. The rooting zone extends into the substratum.

Most areas of this soil are in woodland. A few areas are used for pasture, and some are in residential development.

Slope and the stones on the surface limit the soil for cultivated crops and for recreational and residential development. The slope and moderate or moderately rapid permeability limit use of the soil as a site for waste disposal facilities. In areas used for pasture the use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable plant species.

The soil is suitable for trees and woodland wildlife habitat.

This unit is in capability subclass VIs.

CrB—Charlton-Rock outcrop-Hollis complex, 3 to 8 percent slopes. This unit consists of well drained, deep Charlton soils, exposed bedrock, and somewhat excessively drained, shallow Hollis soils on ridges and hills. Slopes are complex and 50 to 400 feet long. The surface is covered by stones 1 to 3 feet in diameter and areas of Rock outcrop that are 30 to 100 feet apart. The areas consist of approximately 60 percent Charlton soils, 15 percent Rock outcrop, 10 percent Hollis soils, and 15 percent other soils. The soils and exposed bedrock in this unit are so intermingled that it was not practical to map them separately.

Typically, the Charlton soils have a surface layer of very friable, dark brown fine sandy loam about 4 inches thick. The subsoil is friable, brown fine sandy loam in the upper 7 inches and friable, dark yellowish brown gravelly fine sandy loam in the lower 17 inches. The substratum is friable, olive brown gravelly fine sandy loam to a depth of 60 inches or more.

Typically, the Hollis soils have a surface layer of friable, very dark brown fine sandy loam about 5 inches thick. The subsoil is friable fine sandy loam that is brown in the upper 5 inches and dark yellowish brown in the lower 6 inches. Hard granite bedrock is at a depth of 16 inches.

Included with this complex in mapping are small areas of Woodbridge and Ridgebury soils and areas where exposed bedrock and stones are more than 100 feet apart.

Permeability is moderate or moderately rapid in the Charlton and Hollis soils. Available water capacity is moderate in the Charlton soils and very low in the Hollis soils. The rooting zone extends into the substratum of the Charlton soils and to bedrock in the Hollis soils. Reaction is very strongly acid to medium acid in both soils.

Most areas of these soils are in woodland. Some areas are in residential and urban development.

Exposed bedrock and stones on the surface make these soils poorly suited to farming and limit their use for recreational development other than picnic areas. The shallow depth to bedrock in the Hollis soils limits use for playgrounds.

The shallow depth to bedrock, stones on the surface, and moderate or moderately rapid permeability limit use of the soils for residential development and as a site for waste disposal facilities.

The Charlton soils are suitable for trees and woodland wildlife habitat, and the Hollis soils are poorly suited to these uses.

This unit is in capability subclass VIs.

CrC—Charlton-Rock outcrop-Hollis complex, 8 to 15 percent slopes. This unit consists of well drained, deep Charlton soils, exposed bedrock, and somewhat excessively drained, shallow Hollis soils on ridges and hills. Slopes are complex and 50 to 400 feet long. The surface is covered by stones 1 to 3 feet in diameter and areas of Rock outcrop that are 30 to 100 feet apart. The areas consist of approximately 60 percent Charlton soils, 15 percent Rock outcrop, 10 percent Hollis soils, and 15 percent other soils. The soils and exposed bedrock in this unit are so intermingled that it was not practical to map them separately.

Typically, the Charlton soils have a surface layer of very friable, dark brown fine sandy loam about 4 inches thick. The subsoil is friable, brown fine sandy loam in the upper 7 inches and friable, dark yellowish brown gravelly fine sandy loam in the lower 17 inches. The substratum is friable, olive brown gravelly fine sandy loam to a depth of 60 inches or more.

Typically, the Hollis soils have a surface layer of friable, very dark brown fine sandy loam about 5 inches thick. The subsoil is friable fine sandy loam that is brown in the upper 5 inches and dark yellowish brown in the lower 6 inches. Hard granite bedrock is at a depth of 16 inches.

Included with this complex in mapping are small areas of Woodbridge and Ridgebury soils and areas with ex-

posed bedrock and stones more than 100 feet apart on the surface.

Permeability is moderate or moderately rapid in the Charlton and Hollis soils. Available water capacity is moderate in the Charlton soils and very low in the Hollis soils. The rooting zone extends into the substratum of the Charlton soils and to bedrock in the Hollis soils. Reaction is very strongly acid to medium acid in both soils.

Most areas of these soils are in woodland. A few areas are in residential development.

Exposed bedrock, slope, and stones on the surface make these soils poorly suited to farming and limit their use for recreational development. The shallow depth to bedrock in the Hollis soils is a limitation in places.

The exposed bedrock, stones, slope, and shallow depth to bedrock, as well as the moderate or moderately rapid permeability, also limit use of the soils for residential development and as a site for waste disposal facilities.

The Charlton soils are suitable for trees and woodland wildlife habitat, and the Hollis soils are poorly suited to these uses.

This unit is in capability subclass VIs.

CrD—Charlton-Rock outcrop-Hollis complex, 15 to 25 percent slopes. This unit consists of well drained, deep Charlton soils, exposed bedrock, and somewhat excessively drained, shallow Hollis soils on ridges and hills. Slopes are complex and 50 to 400 feet long. The surface is covered by stones 1 to 3 feet in diameter and areas of Rock outcrop that are 30 to 100 feet apart. The areas consist of approximately 60 percent Charlton soils, 15 percent Rock outcrop, 10 percent Hollis soils, and 15 percent other soils. The soils and exposed bedrock in this unit are so intermingled that it was not practical to map them separately.

Typically, the Charlton soils have a surface layer of very friable, dark brown fine sandy loam about 4 inches thick. The subsoil is friable, brown fine sandy loam in the upper 7 inches and friable, dark yellowish brown gravelly fine sandy loam in the lower 17 inches. The substratum is friable, olive brown gravelly fine sandy loam to a depth of 60 inches or more.

Typically, the Hollis soils have a surface layer of friable, very dark brown fine sandy loam about 5 inches thick. The subsoil is friable fine sandy loam that is brown in the upper 5 inches and dark yellowish brown in the lower 6 inches. Hard granite bedrock is at a depth of 16 inches.

Included with this complex in mapping are small areas of Woodbridge and Ridgebury soils and areas with Rock outcrop and stones more than 100 feet apart on the surface.

Permeability is moderate or moderately rapid in the Charlton and Hollis soils. Available water capacity is moderate in the Charlton soils and very low in the Hollis soils. The rooting zone extends into the substratum of the Charlton soils and to bedrock in the Hollis soils. Reaction is very strongly acid to medium acid in both soils.

Most areas of these soils are in woodland. A few acres are in residential development.

Exposed bedrock, slope, and stones on the surface make these soils poorly suited to farming and limit their use for recreational development. The shallow depth to bedrock in the Hollis soils is a limitation in places.

The exposed bedrock, stones, slope, and shallow depth to bedrock, as well as the moderate or moderately rapid permeability, also limit use of the soils for residential development and as a site for waste disposal facilities.

The Charlton soils are suitable for trees and woodland wildlife habitat, and the Hollis soils are poorly suited to these uses.

This unit is in capability subclass VIs.

De—Deerfield loamy fine sand. This deep, nearly level, moderately well drained soil is in irregularly shaped areas that range from 5 to 40 acres. Slopes are smooth and are 100 to 600 feet long.

Typically, the surface layer is very friable, very dark brown loamy fine sand about 9 inches thick. The subsoil is 24 inches thick. It is strong brown and yellowish brown loamy fine sand in the upper 16 inches and loose, mottled, yellowish brown fine sand in the lower 8 inches. The substratum is loose, mottled, light brownish gray sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Windsor and Wareham soils and areas of steeper Deerfield soils. Included soils make up about 20 percent of this map unit.

The permeability of this soil is rapid in the subsoil and very rapid in the substratum. Available water capacity is low. Reaction ranges from very strongly acid to medium acid. The rooting zone extends to a depth of about 36 inches, below which root growth is restricted by a seasonal high water table.

Most areas of this soil are in woodland. Some areas are farmed, and some are in residential development.

This soil is suitable for cultivated crops, hay, and pasture. The seasonal high water table is a main limitation, but the soil is droughty in summer. The erosion hazard is slight. The main farming management practices include frequent irrigation and application of fertilizer, additions of organic matter to the surface layer, and the use of cover crops.

The sandy texture of the soil limits recreational development, and the seasonal high water table limits residential development. The seasonal high water table and the very rapid permeability of the substratum limit use of the soil as a site for waste disposal facilities.

This soil is suitable for trees but is poorly suited to woodland wildlife habitat.

The unit is in capability subclass IIIw.

Du—Dumps. This unit consists of areas used for residential or commercial trash disposal. Most are in or near urban areas throughout the survey area and are adjacent to poorly drained and very poorly drained soils. Most areas range from 3 to 40 acres.

Dumps are commonly called landfills or sanitary landfills and consist mostly of paper, metal, plastic, glass, rubble, cinders, and organic debris. The characteristics of each area vary according to the kinds of refuse and the manner in which it has been deposited and packed and whether the areas have been leveled, covered, or graded. All areas are subject to some degree of subsidence.

Included with this unit in mapping are small areas of Ridgebury, Leicester, Raynham, Walpole, Scarboro, and Whitman soils and other poorly drained and very poorly drained soils. Also included are a few areas that have been reclaimed and that are used for recreational sites.

Onsite investigation and evaluation of these areas is required for land use decisions.

This unit is not assigned to a capability subclass.

ElA—Elmwood fine sandy loam, 0 to 3 percent slopes. This deep, nearly level, moderately well drained soil is in irregularly shaped areas that range from 5 to 15 acres. Slopes are smooth and are typically 200 to 400 feet long.

Typically, the surface layer is very friable, very dark gray fine sandy loam about 1 inch thick. The subsoil is very friable fine sandy loam 34 inches thick and is mottled in the lower 14 inches. It is reddish brown, dark yellowish brown, yellowish brown, and light olive brown. The substratum is mottled, firm, and olive colored to a depth of 60 inches or more. It is silty clay loam to a depth of 42 inches and silty clay at a depth of more than 42 inches.

Included with this soil in mapping are small areas of Swanton and Melrose soils and a few areas in which the substratum is more than 40 inches below the surface. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and slow in the substratum. Available water capacity is high. Reaction ranges from strongly acid to slightly acid in the subsoil and slightly acid or neutral in the substratum. The rooting zone of plants extends through the subsoil, but root growth is restricted by a seasonal high water table which is in the lower part of the subsoil during winter and early spring.

Most areas of this soil have been farmed, and some areas still are farmed. Some previously cleared areas have reverted to or been planted to trees. A few areas are in urban development.

This soil is well suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas, and the erosion hazard is slight. Wetness is the major management concern. The main management needs include installing subsurface drains where needed, improving tilth, and increasing the organic matter content of the soil. Mixing crop residue and manure into the surface layer helps to improve tilth and increase organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is generally suitable for picnic areas and some other recreational uses. A susceptibility to frost action and the hazard of shrinking and swelling in the substratum limit the soil for urban uses, and the seasonal high water table and the slow permeability of the substratum are limitations for waste disposal facilities.

The soil is suitable for trees and for openland and woodland wildlife habitat.

This unit is in capability subclass IIw.

ElB—Elmwood fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, moderately well drained soil is on irregularly shaped areas that range from 5 to 15 acres. Slopes are smooth or undulating and are typically 200 to 400 feet long.

Typically, the surface layer is very friable, very dark gray fine sandy loam about 1 inch thick. The subsoil is very friable fine sandy loam 34 inches thick that is mottled in the lower 14 inches. The subsoil is reddish brown, dark yellowish brown, yellowish brown, and light olive brown. The substratum is mottled, firm, and olive colored to a depth of 60 inches or more. It is silty clay loam to a depth of 42 inches and silty clay at a depth of more than 42 inches.

Included with this soil in mapping are small areas of Swanton and Melrose soils that make up about 15 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and slow in the substratum. Available water capacity is high. Reaction ranges from strongly acid to slightly acid in the subsoil and slightly acid or neutral in the substratum. The rooting zone extends through the subsoil, but root growth is restricted by a seasonal high water table which is in the lower part of the subsoil during winter and early spring.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some of the acreage is farmed, and some is in urban and residential development.

This soil is well suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas, and the erosion hazard is moderate. Wetness is the major management concern. The main farming management needs include installing subsurface drains where needed, improving tilth, and increasing the organic matter content of this soil. Mixing crop residue and manure into the surface layer helps to improve tilth and increase the organic matter content. Using grasses and

legumes in the cropping system helps reduce erosion. The use of proper stocking rates, deferred grazing, and pasture rotation are pasture management practices that maintain desirable plant species.

The slow permeability in the substratum limits the soil for some recreational uses. The slow permeability and the seasonal high water table also limit use of the soil for waste disposal facilities. This soil is suitable for trees and for openland and woodland wildlife habitat.

The soil is limited for urban uses by a susceptibility to frost action and shrinking and swelling in the substratum.

This unit is in capability subclass IIw.

Ha—Hadley very fine sandy loam. This nearly level, well drained soil is on flood plains of the larger rivers. The areas are flooded about once every 5 to 10 years. They are generally long and narrow, but some are irregular in shape. They range from 5 to 50 acres. Slopes are smooth and are usually 100 to 1,000 feet long.

Typically, the surface layer is dark brown very fine sandy loam about 9 inches thick. The substratum extends to a depth of 60 inches or more. It is yellowish brown and brown, friable very fine sandy loam to a depth of 56 inches and grayish brown, friable loamy very fine sand at a depth of more than 56 inches.

Included with this soil in mapping are small areas of Winooski, Limerick, Rumney, and Saco Variant soils that make up about 35 percent of this map unit.

The permeability of this soil is moderate or moderately rapid, and available water capacity is high. Reaction ranges from strongly acid to neutral. The rooting zone extends into the substratum.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some of the acreage is farmed, and some is in urban and residential development.

This soil is well suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas, and the erosion hazard is slight. In the spring, soil blowing is a hazard on some unprotected fields. Where this soil is farmed, the use of cover crops and mixing crop residue and manure into the surface layer help minimize soil blowing and maintain tilth. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for trees and for openland and woodland wildlife habitat, but the hazard of flooding limits most types of urban use and most types of recreational development other than paths and trails.

This unit is in capability class I.

HfA—Hinckley loamy sand, 0 to 3 percent slopes. This deep, nearly level, excessively drained soil is in irregularly shaped areas on the tops of terraces, on outwash plains, and on deltas along streams in the survey area. The areas range from 5 to 200 acres. Slopes are smooth and are 100 to 2,000 feet long.

Typically, the surface layer is very friable, dark brown loamy sand about 7 inches thick. The subsoil is loose and yellowish brown and is 12 inches thick. It is gravelly loamy sand in the upper part and sand in the lower part. The substratum is loose, light gray very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Windsor, Carver, Sudbury, and Wareham soils. Also included are areas of soils with a surface layer of very fine sandy loam and small areas of Medisaprists, shallow. Included soils make up about 20 percent of this map unit.

The permeability of this soil is rapid in the subsoil and very rapid in the substratum. Available water capacity is very low. Reaction is extremely acid to medium acid. The rooting zone extends into the substratum.

Many areas of this soil are in residential and urban development. Other areas are in woodland or are idle farmland.

This soil is suitable for cultivated crops, hay, and pasture. The erosion hazard is slight, and the soil is droughty. The main management needs include irrigation, frequent applications of fertilizer, and additions of organic matter to the surface layer.

The sandy texture of this soil limits its use for recreational development. The soil is poorly suited to trees and to woodland and openland wildlife habitat.

The soil is generally suitable for residential development, but the sandy texture makes establishment of lawns difficult and seepage limits use of the soil for waste disposal facilities.

This unit is in capability subclass IIIs.

HfB—Hinckley loamy sand, 3 to 8 percent slopes. This deep, gently sloping, excessivley drained soil is in irregularly shaped areas on the tops of terraces, on outwash plains, and on deltas along streams in the survey area. The areas range from 5 to 120 acres. Slopes are smooth or undulating and are 100 to 1,000 feet long.

Typically, the surface layer is very friable, dark brown loamy sand about 7 inches thick. The subsoil is loose and yellowish brown and is 12 inches thick. It is gravelly loamy sand in the upper part and sand in the lower part. The substratum is loose, light gray very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Windsor, Carver, Sudbury, and Wareham soils. Also included are small areas of Medisaprists, shallow; areas of soils with a surface layer of very fine sandy loam; and areas with stones 20 to 50 feet apart on the surface. Included soils make up about 20 percent of this map unit.

The permeability of this soil is rapid in the subsoil and very rapid in the substratum. Available water capacity is very low. Reaction is extremely acid to medium acid. The rooting zone extends into the substratum.

Many areas of this soil are in residential and urban development. Other areas are in woodland or are idle farmland.

This soil is suitable for cultivated crops, hay, and pasture. The erosion hazard is slight, and the soil is droughty. The main management needs include irrigation, frequent applications of fertilizer, and use of cover crops.

The sandy texture of this soil limits use for recreational development. The soil is poorly suited to woodland and to openland and woodland wildlife habitat.

Slope and the sandy texture are the main limitations of the soil for residential development. Seepage limits the soil for most types of waste disposal facilities.

This unit is in capability subclass IIIs.

HfC—Hinckley loamy sand, 8 to 15 percent slopes. This deep, moderately sloping, excessively drained soil is in irregularly shaped areas that are on the edges of outwash plains and terraces, are adjacent to drainageways, and are on the tops of kames. The areas range from 5 to 45 acres. Slopes are rolling and complex and are 100 to 400 feet long.

Typically, the surface layer is very friable, dark brown loamy sand about 7 inches thick. The subsoil is loose and yellowish brown and is 12 inches thick. It is gravelly loamy sand in the upper part and sand in the lower part. The substratum is loose, light gray very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are areas of Windsor, Carver, Sudbury, and Wareham soils and Medisaprists, shallow. Also included are small areas with stones 20 to 50 feet apart on the surface and areas with rock outcrops. Included soils make up about 20 percent of this map unit.

The permeability of this soil is rapid in the subsoil and very rapid in the substratum. Available water capacity is very low. Reaction is extremely acid to medium acid. The rooting zone extends into the substratum.

Many areas of this soil are in residential development. Other areas are in woodland or are idle farmland.

Slope makes this soil poorly suited to cultivated crops, hay, and pasture. The erosion hazard is moderate, and the soil is droughty. The main management needs include irrigation, frequent applications of fertilizer, erosion control, and use of cover crops.

The sandy texture and slope of the soil limit its use for recreational development. The soil is poorly suited to trees and to openland and woodland wildlife habitat.

The sandy texture also makes lawn establishment difficult, and slope limits use of the soil as a site for septic tank filter fields. Seepage limits use of the soil for most other types of waste disposal facilities.

This unit is in capability subclass IVs.

HfD—Hinckley loamy sand, 15 to 25 percent slopes. This deep, moderately steep, excessively drained soil is on terrace escarpments, eskers, and kames. The areas are elongated or irregular in shape and range from 5 to 30 acres. Slopes are complex and are 100 to 300 feet long.

Typically, the surface layer is very friable, dark brown loamy sand about 7 inches thick. The subsoil is loose and yellowish brown and is 12 inches thick. It is gravelly loamy sand in the upper part and sand in the lower part. The substratum is loose, light gray very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are areas with stones 20 to 50 feet apart on the surface and areas with rock outcrops. Included areas make up about 20 percent of this map unit.

The permeability of this soil is rapid in the subsoil and very rapid in the substratum. Available water capacity is very low. Reaction is extremely acid to medium acid. The rooting zone extends into the substratum.

This soil is poorly suited to cultivated crops, hay, and pasture. The soil is droughty, and slope limits the use of equipment. The erosion hazard is moderate.

Most areas of this soil are in woodland, but the soil is poorly suited to timber production. It is also poorly suited to openland and woodland wildlife habitat.

Slope limits use of the soil for most types of recreational and urban development. Seepage is a limitation for waste disposal facilities.

This unit is in capability subclass VIs.

HWE—Hinckley and Windsor loamy sands, steep. These deep, steep, excessively drained soils are on the edges of terraces and the sides of kames and eskers. The areas are long and narrow and range from 10 to 150 acres. Slopes range from 25 to 35 percent and are smooth and 50 to 200 feet long. Some areas of these soils are dominantly Hinckley soils, some are dominantly Windsor soils, and some are both. The soils were mapped together because they have no major differences in use and management.

The mapped acreage of this unit is about 60 percent Hinckley soils, 20 percent Windsor soils, and 20 percent other soils.

Typically, the Hinckley soils have a surface layer of very friable, dark brown loamy sand about 3 inches thick. The subsoil is loose and yellowish brown and is 12 inches thick. It is gravelly loamy sand in the upper part and sand in the lower part. The substratum is loose, light gray very gravelly sand to a depth of 60 inches or more.

Typically, the Windsor soils have a surface layer of very friable, very dark grayish brown loamy sand about 3 inches thick. The subsoil is 17 inches thick. It is loose, yellowish brown loamy sand in the upper part and loose, yellowish brown and very pale brown sand in the lower part. The substratum is loose, pale yellow sand to a depth of 60 inches or more.

Included with these soils in mapping are small areas of Carver soils and a few areas with stones 30 to 100 feet apart on the surface.

Permeability in the Hinckley soils is rapid in the subsoil and very rapid in the substratum, and it is rapid throughout the Windsor soils. Available water capacity is very low in the Hinckley soils and low in the Windsor soils. The Hinckley soils are extremely acid to medium acid, and the Windsor soils are very strongly acid or strongly acid.

These soils are poorly suited for cultivated crops, hay, and pasture. The soils are droughty, and the erosion hazard is severe.

Most areas of this unit are in woodland, but the soils are poorly suited for timber production. They are also poorly suited for openland and woodland wildlife habitat.

Slope limits the use of the soils for most types of recreational and urban development, and seepage is a limitation for waste disposal facilities.

This unit is in capability subclass VIIs.

IW—Ipswich and Westbrook mucky peats. These deep, nearly level, very poorly drained soils are in irregularly shaped areas that are subject to daily tidal inundation. The areas range from 10 to 1,000 acres or more. Some are dominantly Ipswich soils, some are Westbrook soils, and some are both. These soils were mapped together because they have no major differences in use and management.

The mapped acreage of this unit is about 50 percent Ipswich soils, 30 percent Westbrook soils, and 20 percent other soils.

Typically, the Ipswich soils have a surface layer of dense, dark grayish brown mucky peat about 18 inches thick. It consists of many live herbaceous roots and decaying plant remains. Below the surface layer is a layer about 24 inches thick of very dark grayish brown organic material in a more advanced state of decomposition. Between depths of 42 and 60 inches is very dark gray, very highly decomposed organic material.

Typically, the Westbrook soils have a surface layer of very dark grayish brown mucky peat about 9 inches thick. This is underlain by 36 inches of black, dark brown, very dark grayish brown, and very dark gray decomposed organic material. Between depths of 45 and 60 inches is friable, very dark gray silt loam.

Included with these soils in mapping are areas with 2 to 4 feet of organic material over loamy sand or sand that comprise up to 40 percent of some map units. Also included are small areas of soils with less than 16 inches of organic material over mineral material and a few small areas of rock outcrop.

Permeability is moderate to rapid in the organic layers of the Ipswich and Westbrook soils and moderate in the substratum of the Westbrook soils. Available water capacity is high in both soils. Reaction ranges from strongly acid to neutral in the Ipswich soils. Reaction in the Westbrook soils is very strongly acid to neutral in the organic material and medium acid to neutral in the substratum. Acidity increases if these soils are drained. The rooting zone in these soils is commonly restricted to a depth of 2 feet.

Most areas of this unit are in salt-tolerant grasses. The daily tidal flooding limits the soils for most uses other than wetland wildlife habitat.

This unit is in capability subclass VIIIw.

LeA—Leicester fine sandy loam, 0 to 3 percent slopes. This deep, nearly level, poorly drained soil is in irregularly shaped areas in depressions and along drainageways. The areas range from 5 to 50 acres. Slopes are smooth and concave.

Typically, the surface layer is friable, very dark gray fine sandy loam about 5 inches thick. The subsoil is mottled, friable fine sandy loam 23 inches thick. It is olive in the upper part and olive gray in the lower part. The substratum is mottled, firm, olive gray gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Woodbridge and Whitman soils that make up about 15 percent of this map unit.

The permeability of this soil is moderate to moderately rapid in the subsoil and moderately rapid in the substratum. Available water capacity is moderate. Reaction is strongly acid or very strongly acid to a depth of 40 inches. The rooting zone extends into the substratum, but root growth is restricted by a seasonal high water table which is at or near the surface in winter and spring.

Most areas of this soil have been farmed. Most previously cleared areas have reverted to brush and trees.

This soil is suitable for cultivated crops, hay, and pasture. The seasonal high water table keeps the soil saturated through late spring. The erosion hazard is slight. The main management needs include installing field drains where feasible, proper timing of farming operations, and use of suitable plant species. The use of proper stocking rates, deferred grazing, pasture rotation, and controlled grazing when the soil is saturated help maintain desirable pasture plant species.

The soil is suitable for trees and wetland wildlife habitat, but the seasonal high water table limits recreational development. The seasonal high water table and a susceptibility to frost action are major limitations for residential development. The moderately rapid permeability in the substratum and the seasonal high water table limit use of the soil for waste disposal facilities.

This unit is in capability subclass IIIw.

LeB—Leicester fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, poorly drained soil is in irregularly shaped areas in depressions and along drainageways. The areas range from 5 to 50 acres. Slopes are smooth and concave.

Typically, the surface layer is friable, very dark gray fine sandy loam about 5 inches thick. The subsoil is mottled, friable fine sandy loam 23 inches thick. It is olive in the upper part and olive gray in the lower part. The substratum is mottled, firm, olive gray gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Woodbridge and Whitman soils that make up about 15 percent of this map unit.

The permeability of this soil is moderate to moderately rapid in the subsoil and moderately rapid in the substratum. Available water capacity is moderate. Reaction is strongly acid or very strongly acid to a depth of 40 inches. The rooting zone extends into the substratum, but root growth is restricted by a seasonal high water table which is at or near the surface in winter and spring.

Most areas of this soil have been farmed. Most previously cleared areas have reverted to brush and trees.

This soil is suitable for cultivated crops, hay, and pasture. The seasonal high water table keeps the soil saturated through late spring. The erosion hazard is moderate. The main management needs include installing field drains where feasible, proper timing of farming operations, and use of suitable plant species. The use of proper stocking rates, deferred grazing, pasture rotation, and controlled grazing when the soil is saturated help to maintain desirable plant species.

The soil is suitable for trees, but the seasonal high water table limits most types of recreational or residential development. A susceptibility to frost action also limits the soil for residential development, and the moderately rapid permeability is an additional limitation for waste disposal facilities.

This unit is in capability subclass IIIw.

Lr—Limerick and Rumney soils. These deep, nearly level, poorly drained soils are on flood plains of the larger rivers in the survey area. The areas commonly are flooded in spring (fig. 11). They range from 5 to 30 acres. Slopes are smooth and are typically 100 to 500 feet long. Some areas of this unit are dominantly Limerick soils, some are dominantly Rumney soils, and some are both. The soils were mapped together because they have no major differences in use and management.

The mapped acreage of this unit is about 60 percent Limerick soils, 25 percent Rumney soils, and 15 percent other soils.

Typically, the Limerick soils have a surface layer of friable, dark grayish brown silt loam 9 inches thick. The subsoil is brown, mottled, friable silt loam 4 inches thick. The substratum extends to a depth of 60 inches or more. It is olive gray silt loam to a depth of 25 inches, gray very fine sandy loam to a depth of 42 inches, gray loose and coarse sand to a depth of 48 inches, and gray very fine sand at a depth of more than 48 inches.

Typically, the Rumney soils have a surface layer of very friable, very dark brown fine sandy loam 5 inches thick. The subsoil is mottled, very friable fine sandy loam that is olive gray in the upper 9 inches and dark grayish brown in the lower 15 inches. The substratum is mottled, olive gray stratified loamy sand, sand, and gravelly sand to a depth of 60 inches or more.

Included with these soils in mapping are small areas of Winooski and Saco Variant soils that make up about 15 percent of this map unit.

Permeability is moderate in the Limerick soils. In the Rumney soils permeability is moderately rapid in the subsoil and rapid in the substratum. Available water capacity is high in the Limerick soils and moderate in the Rumney soils. Reaction ranges from medium acid to neutral in the Limerick soils and from very strongly acid to slightly acid in the Rumney soils. The rooting zone is restricted by a seasonal high water table which is at or near the surface of these soils in winter and spring.

Most areas of this unit are in woodland or are idle farmland.

These soils are suitable for cultivated crops, but planting must be done after the spring floods. The main farming management needs include installing drainage, improving tilth, and increasing the organic matter content of the soils.

The soils are suitable for hay and pasture. The use of proper stocking rates, deferred grazing, pasture rotation, and controlled grazing when the soils are wet help maintain desirable pasture plant species.

Figure 11.—A flooded area of Limerick and Rumney soils.

Flooding and the seasonal high water table limit the soils for recreational and residential development and for most other nonfarm uses except woodland and wetland wildlife habitat. A susceptibility to frost action is an additional limitation for residential development, and the seasonal high water table and flooding limit the soils as a site for waste disposal facilities.

This unit is in capability subclass IIIw.

Ma—Maybid silt loam. This deep, nearly level, very poorly drained soil is in depressions and low areas near the larger streams in the survey area. The areas are irregular in shape and range from 3 to 10 acres. Slopes are smooth and are 100 to 400 feet long.

Typically, the surface layer is friable, very dark gray silt loam about 7 inches thick. The subsurface layer is friable, gray silty clay loam 4 inches thick. The subsoil is firm, mottled, greenish gray silty clay 8 inches thick. The substratum is greenish gray and dark greenish gray, firm silty clay to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Scantic soils and Medisaprists, shallow. Also included are soils with up to 16 inches of organic material on the surface. Included soils make up about 15 percent of this map unit.

The permeability of this soil is slow or very slow. Available water capacity is high, and reaction is medium acid to neutral. The rooting zone is restricted by a seasonal high water table which is at or near the surface in winter and spring.

Most areas of this soil are idle farmland or are covered by shrubs and trees.

This soil is poorly suited to cultivated crops, hay, and pasture. The seasonal high water table is the major limitation for farming. Installing drainage is difficult because of the clayey texture of the soil.

The soil is poorly suited to trees. The seasonal high water table is the main limitation for residential and recreational development and for most nonfarm uses other than wetland wildlife habitat. The clayey texture and low strength of the soil are additional limitations for residential development and waste disposal facilities.

This unit is in capability subclass VIw.

MC—Medisaprists, deep. This unit consists of nearly level, very poorly drained deposits of organic material. The areas range from 5 to 500 acres. The different types of organic deposits in this unit were mapped together because they have no major differences in their use and management.

The material in these areas extends to a depth of 60 inches or more. It generally is black to very dark grayish brown decomposed organic matter or reddish brown fibrous organic matter, but the material in different areas varies in color, thickness, and composition. In many areas where the organic deposits are deeper than 4 feet, the lower part of the soil contains material with many fibers that has undergone very little decomposition.

Included with these soils in mapping are small areas of Medisaprists, shallow, and Whitman, Scarboro, and Birdsall soils. Also included are areas which are flooded most of the year. Included areas make up about 20 percent of this map unit.

The permeability of this unit is moderate to rapid, and available water capacity is high. The rooting zone is restricted by a seasonal high water table that is at or near the surface for more than 9 months of the year.

Most areas of this unit are in woodland, but the soils are poorly suited to timber production. The seasonal high water table and the high content of organic matter limit these soils for most uses other than wetland wildlife habitat.

This unit is in capability subclass VIIw.

MD—Medisaprists, shallow. This unit consists of nearly level, very poorly drained deposits of organic material. The areas range from 5 to 100 acres. The different types of organic deposits in this unit were mapped together because they have no major differences in their use and management.

The organic material in these areas extends to a depth of 16 to 30 inches. It generally is black to very dark grayish brown or reddish brown, but the material in different areas varies in color, thickness, and composition. The organic material is underlain by mineral material that ranges from sand to silty clay loam.

Included with these soils in mapping are small areas of Whitman, Scarboro, and Birdsall soils and Medisaprists, deep. These included soils make up about 20 percent of this map unit.

The permeability of this unit is moderate to rapid, and available water capacity is high. The rooting zone is restricted by a seasonal high water table which is at or near the surface for more than 9 months of the year. Reaction of the soil ranges from extremely acid to medium acid.

Most areas of this unit are in woodland, but the soils are poorly suited to timber production. The seasonal high water table and the high content of organic matter limit these soils for most uses other than wetland wildlife habitat.

This unit is in capability subclass VIIw.

MeB—Melrose fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, well drained soil is in irregularly shaped areas that range from 5 to 30 acres. Slopes are smooth or undulating and are typically 200 to 700 feet long.

Typically, the surface layer is friable, dark brown fine sandy loam about 4 inches thick. The subsoil is very friable, dark yellowish brown sandy loam in the upper 16 inches and very friable, light olive brown loamy sand in

the lower 12 inches. The substratum is firm, olive gray silty clay to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Elmwood and Swanton soils, soils that have slopes of less than 3 percent, and soils that have slopes of 8 to 25 percent. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and slow in the substratum. Available water capacity is moderate. Reaction ranges from strongly acid to medium in the subsoil and strongly acid to neutral in the substratum. The rooting zone extends into the substratum, but root growth is restricted by the clayey texture of the substratum.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some of the acreage still is farmed, and some is in urban and residential development.

This soil is well suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas, and the hazard of erosion is moderate. Where this soil is farmed, minimum tillage and using cover crops and grasses and legumes in the cropping system help to reduce runoff and control erosion. Mixing crop residue and manure into the surface layer improves tilth and increases the organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for trees and for openland and woodland wildlife habitat. The slow permeability of the substratum limits some types of recreational development.

The substratum of this soil is susceptible to shrinking and swelling, and thus the soil is limited for residential development. Use of the soil for waste disposal facilities is limited by the slow permeability and clay content in the substratum.

This unit is in capability subclass IIe.

MmA—Merrimac fine sandy loam, 0 to 3 percent slopes. This deep, nearly level, somewhat excessively drained soil is on stream terraces and outwash plains. The areas are irregular in shape and range from 5 to 300 acres. Slopes are smooth and are 100 to 2,000 feet long.

Typically, the surface layer is very friable, very dark grayish brown fine sandy loam about 8 inches thick. The subsoil is 18 inches thick. It is very friable, dark yellowish brown fine sandy loam in the upper 10 inches and very friable, yellowish brown sandy loam in the lower 8 inches. The substratum is loose, light olive brown gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Hinckley, Sudbury, and Walpole soils and soils that have a surface layer and subsoil of silt loam. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and rapid in the substratum. Available water capacity is moderate. Reaction is extremely acid to medium acid. The rooting zone extends into the substratum.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some areas still are farmed, and many areas are in residential development.

This soil is well suited to cultivated crops, hay, and pasture. Droughtiness is the main limitation. Good tilth is easily maintained in cultivated areas, and the erosion hazard is slight. Where this soil is farmed, minimum tillage and using cover crops and grasses and legumes in the cropping system help to improve tilth and increase the organic matter content of the soil. The use of proper stocking rates, deferred grazing, and pasture rotation are practices that maintain desirable pasture plant species.

This soil is generally suitable for recreational and residential development and for trees and openland and woodland wildlife habitat, but the rapid permeability of the substratum is a limitation for most types of waste disposal facilities.

This unit is in capability subclass IIs.

MmB—Merrimac fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, somewhat excessively drained soil is in irregularly shaped areas on stream terraces and outwash plains. The areas range from 5 to 150 acres. Slopes are smooth or undulating and are 100 to 1,000 feet long.

Typically, the surface layer is very friable, very dark grayish brown fine sandy loam about 8 inches thick. The subsoil is 18 inches thick. It is very friable, dark yellowish brown fine sandy loam in the upper 10 inches and very friable, yellowish brown sandy loam in the lower 8 inches. The substratum is loose, light olive brown gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Hinckley, Sudbury, and Walpole soils. Also included are a few areas of soils that have a surface layer and subsoil of silt loam. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and rapid in the substratum. Available water capacity is moderate. Reaction is extremely acid to medium acid. The rooting zone extends into the substratum.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some areas still are farmed, and many areas are in residential development.

This soil is well suited to cultivated crops, hay, and pasture. Droughtiness is the main limitation. Good tilth is easily maintained in cultivated areas, and the erosion hazard is moderate. Where this soil is farmed, minimum tillage and using cover crops and grasses and legumes in the cropping system help to control erosion, improve tilth, and increase the organic matter content of the soil.

The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

This soil is generally suitable for most recreational developments, for trees, and for openland and woodland wildlife habitat. Slope is a limitation for playgrounds.

The soil is also generally suitable for residential development, but the rapid permeability in the substratum is a limitation for most types of waste disposal facilities.

This unit is in capability subclass IIs.

MmC—Merrimac fine sandy loam, 8 to 15 percent slopes. This deep, sloping, somewhat excessively drained soil is on terraces, escarpments, kames, and eskers. The areas are irregular in shape and range from 5 to 40 acres. Slopes are smooth or rolling and are 50 to 300 feet long.

Typically, the surface layer is very friable, very dark grayish brown fine sandy loam about 8 inches thick. The subsoil is 18 inches thick. It is very friable, dark yellowish brown fine sandy loam in the upper part and very friable, yellowish brown sandy loam in the lower part. The substratum is loose, light olive brown gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Hinckley and Walpole soils. Also included are a few areas of soils that have a surface layer and subsoil of silt loam. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and rapid in the substratum. Available water capacity is moderate. Reaction is extremely acid to medium acid. The rooting zone extends into the substratum.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. A few areas still are farmed, and some areas are in residential development.

This soil is suited to cultivated crops, hay, and pasture. A moderately severe hazard of erosion and droughtiness are the main limitations. Good tilth is easily maintained in cultivated areas. Where this soil is farmed, minimum tillage and the use of cover crops and grasses and legumes in the cropping system help to control erosion, improve tilth, and increase the organic matter content of the soil. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

The soil is suitable for trees and for openland and woodland wildlife habitat, but slope is a limitation for most types of recreational or residential development. The rapid permeability of the substratum is a limitation for most types of waste disposal facilities.

This unit is in capability subclass IIIe.

MmD—Merrimac fine sandy loam, 15 to 25 percent slopes. This deep, moderately steep, somewhat excessively drained soil is on terraces, escarpments, kames, and eskers. The areas are elongated or irregular in shape and range from 5 to 40 acres. Slopes are smooth or rolling and are 50 to 300 feet long.

Typically, the surface layer is very friable, very dark grayish brown fine sandy loam about 3 inches thick. The subsoil is 17 inches thick. It is very friable, dark yellowish brown fine sandy loam in the upper part and very friable, yellowish brown sandy loam in the lower part. The substratum is loose, light olive brown gravelly sand to a depth of 60 inches of more.

Included with this soil in mapping are small areas of Hinckley soils and soils that have a surface layer and subsoil of silt loam. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and rapid in the substratum. Available water capacity is moderate. Reaction is extremely acid to medium acid. The rooting zone extends into the substratum.

Most areas of this soil are in woodland. Some areas have been farmed. Most of the previously cleared areas have reverted to or been planted to trees.

This soil is suited to cultivated crops, hay, and pasture. A severe erosion hazard and droughtiness are the main limitations. Good tilth is easily maintained in cultivated areas. Where this soil is farmed, minimum tillage, contour cultivation, and the use of cover crops and grasses and legumes in the cropping system help to control erosion, improve tilth, and increase the organic matter content of the soil. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

The soil is suitable for trees and for openland and woodland wildlife habitat, but slope limits most types of recreational or residential development. The rapid permeability is an additional limitation for most types of waste disposal facilities.

This unit is in capability subclass IVe.

MoB—Montauk fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, well drained soil is on the tops and upper parts of hills and ridges. The areas range from 5 to 20 acres and are irregularly shaped or rectangular. Slopes are smooth and slightly convex and are 100 to 400 feet long.

Typically, the surface layer is very friable, black fine sandy loam about 2 inches thick. The subsoil is friable fine sandy loam 28 inches thick. It is brown in the upper 4 inches, yellowish brown in the middle 15 inches, and light yellowish brown in the lower 9 inches. The substratum is very firm, light brownish gray gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Scituate and Ridgebury soils, soils with slopes of 0 to 3 percent, and soils that have a subsoil of loamy sand. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the subsoil and moderately slow or slow in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid. The rooting zone extends through the subsoil, below which root growth is restricted by the substratum.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some areas still are farmed, and many are in urban and residential development.

This soil is well suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas, and the erosion hazard is moderate. Where this soil is farmed, stripcropping, minimum tillage, and using cover crops and grasses and legumes in the cropping system help to reduce runoff and control erosion. Mixing crop residue and manure into the surface layer improves tilth and increases the organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

This soil is generally suitable for trees, for openland and woodland wildlife habitat, and for most types of recreational development. Slope is a limitation for playgrounds.

A moderate susceptibility to frost action limits the soil for most types of residential development. Most types of waste disposal facilities are limited by the slow or moderately slow permeability in the substratum.

This unit is in capability subclass IIe.

MoC—Montauk fine sandy loam, 8 to 15 percent slopes. This deep, moderately sloping, well drained soil is on the upper parts of hills and ridges. The areas range from 5 to 20 acres and are irregularly shaped or rectangular. Slopes are smooth and slightly convex and are 100 to 400 feet long.

Typically, the surface layer is very friable, black fine sandy loam about 2 inches thick. The subsoil is friable fine sandy loam 28 inches thick. It is brown in the upper 4 inches, yellowish brown in the middle 15 inches, and light yellowish brown in the lower 9 inches. The substratum is very firm, light brownish gray gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Scituate and Ridgebury soils and soils that have a subsoil of loamy sand. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the subsoil and moderately slow or slow in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid. The rooting zone extends through the subsoil, below which root growth is restricted by the substratum.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some of the acreage still is farmed, and some is in urban and residential development.

This soil is suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas, and the erosion hazard is moderately severe. Where this soil is farmed, stripcropping, minimum tillage, and the use of cover crops and grasses and legumes in the cropping system help to reduce runoff and control erosion. Mixing crop residue and manure into the surface layer improves tilth and increases organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

This soil is suitable for trees and for openland and woodland wildlife habitat, but slope is a limitation for most types of recreational development.

Slope and a moderate susceptibility to frost action limit the soil for residential development. Use of the soil for most types of waste disposal facilities is limited by slope and the slow or moderately slow permeability in the substratum.

This unit is in capability subclass IIIe.

MoD—Montauk fine sandy loam, 15 to 25 percent slopes. This deep, moderately steep, well drained soil is in irregularly shaped areas on the sides of hills and ridges. The areas range from 5 to 20 acres. Slopes are smooth and slightly convex and are 100 to 400 feet long.

Typically, the surface layer is very friable, black fine sandy loam about 2 inches thick. The subsoil is friable fine sandy loam 25 inches thick. It is brown in the upper 4 inches, yellowish brown in the middle 13 inches, and light yellowish brown in the lower 8 inches. The substratum is very firm, light brownish gray gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Scituate and Paxton soils and soils that have a subsoil of loamy sand. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the subsoil and moderately slow or slow in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid. The rooting zone extends through the subsoil, below which root growth is restricted by the substratum.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some of the acreage still is farmed, and some is in urban and residential development.

This soil is suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas, but the erosion hazard is severe. Where this soil is farmed, stripcropping, minimum tillage, and the use of cover crops and grasses and legumes in the cropping system help to reduce runoff and control erosion. Mixing crop residue and manure into the surface layer improves tilth and increases organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

This soil is suitable for trees and woodland wildlife habitat, but slope limits most types of recreational or residential development. The slow or moderately slow permeability in the substratum and slope limit use of the soil for most types of waste disposal facilities.

This unit is in capability subclass IVe.

MsB—Montauk very stony fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, well drained soil is on the tops and upper sides of drumlins. The surface is covered by stones 1 to 3 feet in diameter that are 30 to 100 feet apart. These areas are oval or irregular in shape and range from 20 to 80 acres. Slopes are smooth and slightly convex and are 100 to 300 feet long.

Typically, the surface layer is very friable, black fine sandy loam about 2 inches thick. The subsoil is friable fine sandy loam 28 inches thick. It is brown in the upper 4 inches, yellowish brown in the middle 15 inches, and light yellowish brown in the lower 9 inches. The substratum is very firm, light brownish gray gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Scituate and Ridgebury soils and soils that have a subsoil of loamy sand. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the subsoil and moderately slow or slow in the substratum. Available water capacity is moderate. The rooting zone extends through the subsoil, below which root growth is restricted by the substratum. Reaction ranges from extremely acid to medium acid.

Many areas of this soil are in residential and urban development. Some areas are in woodland, and a few are used for pasture.

The stones on the surface make this soil poorly suited to cultivated crops. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

The soil is suitable for trees and woodland wildlife habitat, but the stones on the surface limit recreational development.

The stony surface and a high frost action potential in this soil are limitations for residential development. The moderately slow or slow permeability of the substratum limits the soil for most types of waste disposal facilities.

This unit is in capability subclass VIs.

MsC—Montauk very stony fine sandy loam, 8 to 15 percent slopes. This deep, moderately sloping, well drained soil is on the sides of drumlins. The surface is covered by stones 1 to 3 feet in diameter that are 30 to 100 feet apart. The areas are irregularly shaped and range from 10 to 40 acres. Slopes are smooth and convex and are 200 to 400 feet long.

Typically, the surface layer is very friable, black fine sandy loam about 2 inches thick. The subsoil is friable fine sandy loam 28 inches thick. It is brown in the upper 4 inches, yellowish brown in the middle 15 inches, and light yellowish brown in the lower 9 inches. The substratum is very firm, light brownish gray gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Scituate and Ridgebury soils and soils that have a subsoil of loamy sand. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the subsoil and moderately slow or slow in the substratum. Available water capacity is moderate. The rooting zone extends through the subsoil, below which root growth is restricted by the substratum. Reaction ranges from extremely acid to medium acid.

Most areas of this soil are in woodland. Some areas are in residential development, and a few are used for pasture.

The stones on the surface make this soil poorly suited to cultivated crops. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

This soil is suitable for trees and woodland wildlife habitat, but slope and stones on the surface are limitations for recreational or residential development. Use of the soil for most types of waste disposal facilities is limited by slope, stones on the surface, and the moderately slow or slow permeability in the substratum.

This unit is in capability subclass VIs.

MsD—Montauk very stony fine sandy loam, 15 to 25 percent slopes. This deep, moderately steep, well drained soil is in irregularly shaped areas on the sides of drumlins. The surface is covered by stones 1 to 3 feet in diameter that are 30 to 100 feet apart. The areas range from 10 to 30 acres. Slopes are smooth and convex and are 100 to 300 feet long.

Typically, the surface layer is very friable, black fine sandy loam about 2 inches thick. The subsoil is friable fine sandy loam 26 inches thick. It is brown in the upper 4 inches, yellowish brown in the middle 14 inches, and light yellowish brown in the lower 8 inches. The substratum is very firm, light brownish gray gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Scituate and Paxton soils and soils that have a subsoil of loamy sand. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the subsoil and moderately slow or slow in the substratum. Available water capacity is moderate. The rooting zone extends through the subsoil, below which root growth is restricted by the substratum. Reaction ranges from extremely acid to medium acid.

Most areas of this soil are in woodland. Some areas are in residential development, and a few are used for pasture.

The stones on the surface make this soil poorly suited to cultivated crops. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

The soil is suitable for trees and woodland wildlife habitat, but slope and the stones on the surface limit its use for recreational or residential development. Use of the soil for most types of waste disposal facilities is limited by slope, the stony surface, and the moderately slow or slow permeability in the substratum.

This unit is in capability subclass VIs.

MxC—Montauk extremely stony fine sandy loam, 5 to 20 percent slopes. This deep, moderately sloping, well drained soil is in irregularly shaped areas on the sides of hills and ridges. The areas range from 10 to 50 acres. The surface is covered by stones 1 to 3 feet in diameter that are 10 to 30 feet apart. Slopes are smooth and convex and are 100 to 400 feet long.

Typically, the surface layer is very friable, black fine sandy loam about 2 inches thick. The subsoil is friable fine sandy loam 28 inches thick. It is brown in the upper 4 inches, yellowish brown in the middle 15 inches, and light yellowish brown in the lower 9 inches. The substratum is very firm, light brownish gray gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Scituate, Paxton, and Ridgebury soils that make up about 15 percent of the map unit.

The permeability of this soil is moderate or moderately rapid in the subsoil and slow or moderately slow in the substratum. Available water capacity is moderate. Reaction ranges from extremely acid to medium acid. The rooting zone extends through the subsoil, below which root growth is restricted by the substratum.

Most areas of this soil are in woodland. Some are in residential development.

This soil is suitable for trees and woodland wildlife habitat, but slope and the stones on the surface make the soil poorly suited to crops and pasture and are major limitations for recreational or residential development. The slow or moderately slow permeability in the substratum is an additional limitation for most types of waste disposal facilities.

This unit is in capability subclass VIIs.

NnA—Ninigret fine sandy loam, 0 to 3 percent slopes. This deep, nearly level, moderately well drained soil is in irregularly shaped areas on outwash plains. The areas range from 5 to 25 acres. Slopes are smooth or gently undulating and are typically 100 to 500 feet long.

Typically, the surface layer is very friable, dark brown fine sandy loam about 9 inches thick. The subsoil is dark yellowish brown, very friable fine sandy loam in the upper 8 inches and light olive brown, mottled, friable fine sandy loam in the lower 6 inches. The substratum extends to a depth of 60 inches or more and is mottled throughout. It is very friable, olive loamy sand to a depth of 30 inches; very friable, olive loamy fine sand to a depth of 38 inches; and loose, light olive brown stratified fine sand and medium sand at a depth of more than 38 inches.

Included with this soil in mapping are small areas of Agawam, Sudbury, and Windsor soils. Also included are small areas of soils with a subsoil of very fine sandy loam and a substratum of gravelly sand. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and rapid in the substratum. Available water capacity is moderate. Reaction is very strongly acid to medium acid. The rooting zone extends into the substratum, but root growth is restricted by a seasonal high water table which is in the lower part of the subsoil during winter and spring.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some of the acreage still is farmed, and some is in residential development.

This soil is well suited to cultivated crops, hay, and pasture. Good tilth is easily maintained, and the hazard of erosion is slight. The seasonal high water table commonly keeps the soil wet in early spring and delays farming operations. Drainage is needed in areas used for crops but is generally not needed for hay and pasture. Mixing crop residue and manure into the surface layer improves tilth and increases the organic matter content of the soil. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

This soil is generally suitable for trees, openland and woodland wildlife habitat, and most types of recreational development, but the seasonal high water table is a limitation for playgrounds.

The seasonal high water table limits the soil for residential development and, along with the rapid permeability in the substratum, for waste disposal facilities.

This unit is in capability subclass IIw.

NnB—Ninigret fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, moderately well drained soil is in irregularly shaped areas on outwash plains. The areas range from 5 to 20 acres. Slopes are smooth or gently undulating and are typically 100 to 300 feet long.

Typically, the surface layer is very friable, dark brown fine sandy loam about 9 inches thick. The subsoil is dark yellowish brown, very friable fine sandy loam in the upper 8 inches and light olive brown, mottled, friable fine sandy loam in the lower 6 inches. The substratum extends to a depth of 60 inches or more and is mottled throughout. It is very friable, olive loamy sand to a depth of 30 inches; very friable, olive loamy fine sand to a depth of 38 inches; and loose, light olive brown stratified

fine sand and medium sand at a depth of more than 38 inches.

Included with this soil in mapping are small areas of Agawam, Sudbury, and Windsor soils that make up about 15 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and rapid in the substratum. Available water capacity is moderate. Reaction is very strongly acid to medium acid. The rooting zone extends into the substratum, but root growth is restricted by a seasonal high water table which is in the lower part of the subsoil during winter and spring.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some of the acreage still is farmed, and some is in residential development.

This soil is well suited to cultivated crops, hay, and pasture. Good tilth is easily maintained, and the hazard of erosion is moderate. The seasonal high water table commonly keeps the soil wet in early spring and delays farming operations. Drainage is needed in areas used for crops but is generally not needed for hay and pasture. Where this soil is farmed, minimum tillage and using cover crops and grasses and legumes in the cropping system help to reduce runoff and erosion. Mixing crop residue and manure into the surface layer improves tilth and increases the organic matter content of the soil. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

The soil is generally suitable for trees, for openland and woodland wildlife habitat, and for most types of recreational development, but the seasonal high water table and slope are limitations for playgrounds.

The seasonal high water table is a limitation for residential development and, along with the rapid permeability in the substratum, for waste disposal facilities.

This unit is in capability subclass IIw.

PaB—Paxton fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, well drained soil is mainly on the top and upper side slopes of drumlins. The soil is in rectangular areas that range from 5 to 20 acres and oval areas that range from 10 to 40 acres. Slopes are smooth and slightly convex and are 100 to 300 feet long.

Typically, the surface layer is very friable, very dark grayish brown fine sandy loam about 6 inches thick. The subsoil extends to a depth of 60 inches or more. It is yellowish brown, friable fine sandy loam to a depth of 15 inches; light olive brown, firm gravelly fine sandy loam to a depth of 21 inches; and olive brown and olive, very firm gravelly fine sandy loam at a depth of more than 21 inches.

Included with this soil in mapping are small areas of Woodbridge and Ridgebury soils. Also included are a few small areas of soils with a subsoil of very fine sandy loam. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the upper part of the subsoil and slow in the lower part. Available water capacity is moderate. The rooting zone extends to a depth of about 21 inches, where it is restricted by the very firm part of the subsoil. In unlimed areas this soil is strongly acid to slightly acid. A perched water table is in the upper part of the subsoil for brief periods in winter and early spring.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some of the acreage still is farmed, and some is in urban and residential development.

This soil is well suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas, and the hazard of erosion is moderate. Where this soil is farmed, stripcropping, minimum tillage, and the use of cover crops and grasses and legumes in the cropping system help to reduce runoff and control erosion. Mixing crop residue and manure into the surface layer improves tilth and increases the organic matter content of the soil. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for trees and openland and woodland wildlife habitat. Slope and the slow permeability in the lower part of the subsoil limit some types of recreational development.

A susceptibility to frost action limits residential development, and the slow permeability limits the soil as a site for septic tank absorption fields.

This unit is in capability subclass IIe.

PaC—Paxton fine sandy loam, 8 to 15 percent slopes. This deep, moderately sloping, well drained soil is mainly on the upper sides of drumlins. The soil is in rectangular areas that range from 5 to 15 acres and oval areas that range from 10 to 30 acres. Slopes are smooth and slightly convex and are 200 to 400 feet long.

Typically, the surface layer is very friable, very dark grayish brown fine sandy loam about 6 inches thick. The subsoil extends to a depth of 60 inches or more. It is yellowish brown, friable fine sandy loam to a depth of 15 inches; light olive brown, firm gravelly fine sandy loam to a depth of 21 inches; and olive brown and olive, very firm gravelly fine sandy loam at a depth of more than 21 inches.

Included with this soil in mapping are small areas of Woodbridge and Ridgebury soils and soils with a subsoil of very fine sandy loam. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the upper part of the subsoil and slow in the lower part. Available water capacity is moderate. The rooting zone extends to a depth of about 21 inches, where it is restricted by the very firm part of the subsoil.

In unlimed areas this soil is strongly acid to slightly acid. A perched water table is in the upper part of the subsoil for brief periods in winter and early spring.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some of the acreage still is farmed, and some is in urban and residential development.

This soil is suited to cultivated crops, orchards, hay, and pasture. Good tilth is easily maintained in cultivated areas, and the hazard of erosion is moderately severe. Where this soil is farmed, stripcropping, terracing, minimum tillage, and the use of cover crops and grasses and legumes in the cropping system help to reduce runoff and control erosion. Mixing crop residue and manure into the surface layer improves tilth and increases the organic matter content of the soil. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for trees and openland and woodland wildlife habitat. Slope and the slow permeability in the lower part of the subsoil limit some types of recreational development.

Slope limits residential development, and the slow permeability limits the soil as a site for septic tank absorption fields.

This unit is in capability subclass IIIe.

PaD—Paxton fine sandy loam, 15 to 25 percent slopes. This deep, moderately steep, well drained soil is mainly on the upper sides of drumlins. The soil is in rectangular areas that range from 5 to 15 acres and oval areas that range from 10 to 30 acres. Slopes are smooth and slightly convex and are 200 to 400 feet long.

Typically, the surface layer is very friable, very dark grayish brown fine sandy loam about 6 inches thick. The subsoil extends to a depth of 60 inches or more. It is yellowish brown, friable fine sandy loam to a depth of 15 inches; light olive brown, firm gravelly fine sandy loam to a depth of 21 inches; and olive brown and olive, very firm gravelly fine sandy loam at a depth of more than 21 inches.

Included with this soil in mapping are small areas of Woodbridge soils and soils with a subsoil of very fine sandy loam. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the upper part of the subsoil and slow in the lower part. Available water capacity is moderate. The rooting zone extends to a depth of about 21 inches, where root growth is restricted by the very firm part of the subsoil. In unlimed areas this soil is strongly acid to slightly acid. A perched water table is in the upper part of the subsoil for brief periods in winter and early spring.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some of the acreage still is farmed, and some is in residential development.

This soil is suited to cultivated crops, orchards, hay, and pasture. Good tilth is easily maintained in cultivated areas, but the hazard of erosion is severe. Where this soil is farmed, stripcropping, terracing, minimum tillage, and the use of cover crops and grasses and legumes in the cropping system help to reduce runoff and control erosion. Mixing crop residue and manure into the surface layer improves tilth and increases the organic matter content of the soil. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for trees and openland and woodland wildlife habitat. Slope limits recreational or residential development. The slow permeability in the subsoil limits the soil as a site for septic tank absorption fields.

This unit is in capability subclass IVe.

PbB—Paxton very stony fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, well drained soil is mainly on the top and upper sides of drumlins. The surface is covered by stones 1 to 3 feet in diameter that are 30 to 100 feet apart. The areas are oval or irregular in shape and range from 20 to 80 acres. Slopes are smooth and slightly convex and are 100 to 300 feet long.

Typically, the surface layer is very friable, very dark grayish brown fine sandy loam about 6 inches thick. The subsoil extends to a depth of 60 inches or more. It is yellowish brown, friable fine sandy loam to a depth of 15 inches; light olive brown, firm gravelly fine sandy loam to a depth to 21 inches; and olive brown and olive, very firm gravelly fine sandy loam at a depth of more than 21 inches.

Included with this soil in mapping are small areas of Woodbridge and Ridgebury soils. Also included are a few small areas with a subsoil of very fine sandy loam and areas where the stones on the surface are 10 to 30 feet apart. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the upper part of the subsoil and slow in the lower part. Available water capacity is moderate. The rooting zone extends to a depth of about 21 inches, where root growth is restricted by the very firm part of the subsoil. Reaction in this soil ranges from strongly acid to slightly acid. A perched water table is in the upper part of the subsoil for brief periods in winter and early spring.

Many areas of this soil are in residential development. Some areas are in woodland, and a few are used for pasture.

The stones on the surface make this soil poorly suited to cultivated crops. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for trees and woodland wildlife habitat, but the stones on the surface and the slow

permeability in the lower part of the subsoil limit use of the soil for most types of recreational or residential development.

This unit is in capability subclass VIs.

PbC—Paxton very stony fine sandy loam, 8 to 15 percent slopes. This deep, moderately sloping, well drained soil is in irregularly shaped areas mainly on the sides of drumlins. The surface is covered by stones 1 to 3 feet in diameter that are 30 to 100 feet apart. The areas range from 10 to 40 acres. Slopes are smooth and convex and are 200 to 400 feet long.

Typically, the surface layer is very friable, very dark grayish brown fine sandy loam about 6 inches thick. The subsoil extends to a depth of 60 inches or more. It is yellowish brown, friable fine sandy loam to a depth of 15 inches; light olive brown, firm gravelly fine sandy loam to a depth of 21 inches; and olive brown and olive, very firm gravelly fine sandy loam at a depth of more than 21 inches.

Included with this soil in mapping are small areas of Woodbridge and Ridgebury soils. Also included are areas with a subsoil of very fine sandy loam. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the upper part of subsoil and slow in the lower part. Available water capacity is moderate. The rooting zone extends to a depth of about 21 inches, where root growth is restricted by the very firm part of the subsoil. Reaction in this soil ranges from strongly acid to slightly acid. A perched water table is in the upper part of the subsoil for brief periods in winter and early spring.

Most areas of this soil are in woodland. Some areas are in residential development, and a few are used for pasture.

The stones on the surface make this soil poorly suited to cultivated crops. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for trees and woodland wildlife habitat, but slope, the stones on the surface, and the slow permeability in the lower part of the subsoil limit use of the soil for most types of recreational or residential development.

This unit is in capability subclass VIs.

PbD—Paxton very stony fine sandy loam, 15 to 25 percent slopes. This deep, moderately steep, well drained soil is in irregularly shaped areas mainly on the sides of drumlins. The surface is covered by stones that are 20 to 50 feet apart. The areas range from 10 to 30 acres. Slopes are smooth and convex and are 100 to 300 feet long.

Typically, the surface layer is very friable, very dark grayish brown fine sandy loam about 6 inches thick. The subsoil extends to a depth of 60 inches or more. It is yellowish brown, friable fine sandy loam to a depth of 15 inches; light olive brown, firm gravelly fine sandy loam to a depth of 21 inches; and olive brown and olive, very firm gravelly fine sandy loam at a depth of more than 21 inches.

Included with this soil in mapping are small areas of Woodbridge soils and soils with a subsoil of fine sandy loam. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the upper part of the subsoil and slow in the lower part. Available water capacity is moderate. The rooting zone extends to a depth of about 21 inches, where root growth is restricted by the very firm part of the subsoil. Reaction in this soil is strongly acid to slightly acid. A perched water table is in the upper part of the subsoil for brief periods in winter and early spring.

Most areas of this soil are in woodland. A few areas are in residential development.

Slope and the stones on the surface make this soil poorly suited to cultivated crops. In pastured areas the use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable plant species.

The soil is suitable for trees and woodland wildlife habitat. Slope limits use of the soil for residential or recreational development and as a site for septic tank absorption fields. The stones on the surface also limit recreational development, and the slow permeability in the lower part of the subsoil is an additional limitation for septic tank absorption fields.

This unit is in capability subclass VIs.

PcC—Paxton extremely stony fine sandy loam, 8 to 15 percent slopes. This deep, moderately sloping, well drained soil is in irregularly shaped areas mainly on the sides of drumlins. The areas range from 5 to 15 acres. The surface is covered by stones 1 to 4 feet in diameter that are 10 to 30 feet apart. Slopes are smooth, convex, and 200 to 400 feet long.

Typically, the surface layer is very friable, very dark grayish brown fine sandy loam about 4 inches thick. The subsoil extends to a depth of 60 inches or more. It is yellowish brown, friable fine sandy loam to a depth of 15 inches; light olive brown, firm gravelly fine sandy loam to a depth of 21 inches; and olive brown and olive, very firm gravelly fine sandy loam at a depth of more than 21 inches.

Included with this soil in mapping are small areas of Woodbridge and Ridgebury soils and soils with a subsoil of very fine sandy loam. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the upper part of the subsoil and slow in the lower part. Available water capacity is moderate. The rooting zone extends to a depth of about 21 inches, where root growth is restricted by the very firm part of the subsoil. Reaction ranges from strongly acid to slightly

acid. A perched water table is in the upper part of the subsoil for brief periods in winter and early spring.

Most areas of this soil are in woodland. Some areas are in residential development.

The stones on the surface make this soil poorly suited to cultivated crops, hay, or pasture.

The soil is suitable for trees and woodland wildlife habitat, but the stones on the surface limit use of the soil for recreational or residential development and as a site for septic tank absorption fields. Slope also limits recreational development, and the slow permeability in the lower part of the subsoil is an additional limitation for septic tank absorption fields.

This unit is in capability subclass VIIs.

PcD—Paxton extremely stony fine sandy loam, 15 to 25 percent slopes. This deep, moderately steep, well drained soil is in irregularly shaped areas on the sides of drumlins. The surface is covered by stones 1 to 4 feet in diameter that are 10 to 30 feet apart. The areas range from 15 to 50 acres. Slopes are smooth and convex and are 200 to 400 feet long.

Typically, the surface layer is very friable, very dark grayish brown fine sandy loam about 4 inches thick. The subsoil extends to a depth of 60 inches or more. It is yellowish brown, friable fine sandy loam to a depth of 15 inches; light olive brown, firm gravelly fine sandy loam to a depth of 21 inches; and olive brown and olive, very firm gravelly fine sandy loam at a depth of more than 21 inches.

Included with this soil in mapping are small areas of Woodbridge soils that make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the upper part of the subsoil and slow in the lower part. Available water capacity is moderate. The rooting zone extends to a depth of about 21 inches, where root growth is restricted by the very firm part of the subsoil. Reaction in this soil is strongly acid to slightly acid. A perched water table is in the upper part of the subsoil for brief periods in winter and early spring.

Most areas of this soil are in woodland. A few areas are in residential development.

Slope and the stones on the surface make this soil poorly suited to cultivated crops, hay, or pasture.

The soil is suitable for trees and woodland wildlife habitat, but slope and the stones on the surface limit use of the soil for recreational or residential development and as a site for septic tank absorption fields. The slow permeability in the lower part of the subsoil is an additional limitation for septic tank absorption fields.

This unit is in capability subclass VIIs.

PcE—Paxton extremely stony fine sandy loam, 25 to 45 percent slopes. This deep, steep, well drained soil is in irregularly shaped areas mainly on the sides of drumlins. The surface is covered by stones 1 to 4 feet in diameter that are 10 to 30 feet apart. The areas range from 15 to 50 acres. Slopes are smooth and convex and are 200 to 400 feet long.

Typically, the surface layer is very friable, very dark grayish brown fine sandy loam about 4 inches thick. The subsoil extends to a depth of 60 inches or more. It is yellowish brown, friable fine sandy loam to a depth of 15 inches; light olive brown, firm gravelly fine sandy loam to a depth of 21 inches; and olive brown and olive, very firm gravelly fine sandy loam at a depth of more than 21 inches.

Included with this soil in mapping are small areas of Woodbridge, Charlton, and Montauk soils that make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the upper part of the subsoil and slow in the lower part. Available water capacity is moderate. The rooting zone extends to a depth of about 21 inches, where root growth is restricted by the very firm part of the subsoil. Reaction in this soil is strongly acid to slightly acid. A perched water table is in the upper part of the subsoil for brief periods in winter and early spring.

This soil is suitable for trees and woodland wildlife habitat, and most areas of the soil are wooded. Slope and the stones on the surface limit the use of timber equipment.

Slope and the stones on the surface also limit most other uses of the soil, including recreational and residential development and as a site for septic tank absorption fields. The slow permeability in the lower part of the subsoil is an additional limitation for septic tank absorption fields.

This unit is in capability subclass VIIs.

Pe—Pipestone loamy sand. This deep, nearly level, somewhat poorly drained soil is in irregularly shaped areas on outwash plains. The areas range from 5 to 25 acres. Slopes are smooth and are 100 to 400 feet long.

Typically, the surface layer is friable, black loamy sand about 4 inches thick. The subsurface layer is loose, gray sand about 4 inches thick. The subsoil is 24 inches thick and is mottled throughout. It is loose, dark yellowish brown and olive brown loamy sand in the upper 13 inches and light olive brown sand in the lower 11 inches. The substratum is loose, mottled, olive gray and gray sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Deerfield, Wareham, and Scarboro soils. Also included are a few small areas of gently sloping Pipestone soils. Included soils make up about 20 percent of this map unit.

The permeability of this soil is rapid in the subsoil and very rapid in the substratum. Available water capacity is low. Reaction ranges from very strongly acid to neutral in the upper part of the subsoil and from strongly acid to neutral in the lower part of the subsoil and in the substratum. The rooting depth extends into the substratum,

but root growth is restricted by a seasonal high water table which is at or near the surface in winter and spring. The soil is droughty when the water table recedes during summer and early fall.

Most areas of this soil are in woodland. A few areas are used for pasture.

This soil is suited to cultivated crops, hay, and pasture. The main limitation for these uses is the seasonal high water table. The erosion hazard is slight. The main management needs include installing field drainage, increasing organic matter content, and improving tilth. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for trees but is poorly suited to most types of wildlife habitat. The seasonal high water table limits use of the soil for recreational and residential development and as a site for waste disposal facilties. Very rapid permeability in the substratum is an additional limitation for sanitary landfills.

This unit is in capability subclass IVw.

Pg—Pits, gravel. This unit consists of irregularly shaped areas from which gravel has been removed for construction purposes. The areas range from 2 to 100 acres or more. The pits are 3 to 50 feet deep and mainly have steep sides and a nearly level floor. Piles of stones and boulders are commonly scattered on the pit floor. Some areas have small pools of water, and some have rock outcrops.

These pits are generally devoid of vegetation, although some older ones have scattered bushes, grass, and annuals. Most pits are droughty, but some have been excavated to a depth below the seasonal high water table.

Areas of this unit are generally poorly suited to farming, recreational and residential development, and wildlife habitat. Onsite investigation is necessary for any proposed use.

This unit is not assigned to a capability subclass.

Qu—Quarries. This unit consists of areas that have been excavated for granite. The areas typically are on the sides and tops of ridges and range from nearly level to vertical. They consist of layers of exposed bedrock. The walls are mainly vertical, and the bottom is generally excavated in steps. Small pools of water are at the bottom of many quarries, and some have small piles of broken granite at the bottom and along the edges.

These areas are generally idle after mining is completed. The lack of soil material and difficulty of excavation prevents reclamation, and very few areas have been reclaimed. Very little vegetation grows in or around the quarries. The areas have poor potential for most uses because of exposed bedrock, a high percentage of small stone fragments, and very low available water capacity.

This unit is not assigned to a capability subclass.

Ra—Raynham silt loam. This deep, nearly level, poorly drained soil is in low areas and depressions near large streams. The areas are irregular in shape and range from 5 to 50 acres. Slopes are smooth and concave.

Typically, the surface layer is friable, very dark grayish brown silt loam about 10 inches thick. It is mottled in the lower 6 inches. The subsoil is friable, mottled, light olive brown and olive very fine sandy loam 17 inches thick. The substratum is friable, mottled, and olive gray, and it extends to a depth of 60 inches or more. It is very fine sandy loam to a depth of 36 inches, loamy very fine sand to a depth of 47 inches, and very fine sandy loam at a depth of more than 47 inches.

Included with this soil in mapping are small areas of Belgrade, Birdsall, Walpole Variant, and Amostown soils. Also included are a few small areas of soils with slopes of 3 to 8 percent. Included soils make up about 25 percent of this map unit.

The permeability of this soil is moderately slow or moderate in the subsoil and slow in the substratum. Available water capacity is high. Reaction is strongly acid to neutral in the subsoil and slightly acid to mildly alkaline in the substratum. The rooting zone extends to the substratum, but root growth is impeded by a seasonal high water table which is at or near the surface in winter and spring.

This soil is suited to cultivated crops, hay, and pasture. Wetness is the main limitation for these uses, and the soil needs drainage where feasible. The erosion hazard is slight. Where this soil is cultivated, minimum tillage and the use of cover crops and grasses and legumes in the cropping system help improve tilth and increase organic matter content. Use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for trees, and most of the areas are wooded. The soil is also suitable for wetland wildlife habitat, but the seasonal high water table is a limitation for recreational and residential development and for waste disposal facilities.

This unit is in capability subclass IIIw.

RdA—Ridgebury fine sandy loam, 0 to 3 percent slopes. This deep, nearly level, poorly drained soil is in irregularly shaped areas in depressions and along drainageways. The areas range from 5 to 30 acres. Slopes are smooth and concave.

Typically, the surface layer is friable, very dark brown fine sandy loam about 9 inches thick. The subsoil is firm, mottled, olive gray fine sandy loam about 9 inches thick. The substratum is mottled, firm, olive and olive brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Woodbridge and Whitman soils. Also included are areas with a substratum of loamy sand. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the subsoil and slow or very slow in the substratum. Available water capacity is very low, and reaction ranges from very strongly acid to medium acid. The rooting zone extends to the substratum, but root growth is restricted by a seasonal high water table which is at or near the surface in winter and spring.

Most areas of this soil have been farmed, but most of the previously cleared areas have reverted to trees and brush.

This soil is suitable for cultivated crops, hay, and pasture. The seasonal high water table keeps the soil saturated through late spring. The erosion hazard is slight. The main management needs include installing field drains where feasible, proper timing of farming operations, and use of water-tolerant plant species. The use of proper stocking rates, deferred grazing, pasture rotation, and restricted grazing when the soil is saturated help maintain desirable pasture plant species.

The soil is suitable for trees and most types of wildlife habitat, but the seasonal high water table limits recreational and residential development and limits use of the soil as a site for waste disposal facilities.

This unit is in capability subclass IIIw.

RdB—Ridgebury fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, poorly drained soil is in depressions and along drainageways. The areas are oval and long and narrow and range from 5 to 15 acres. Slopes are smooth and concave.

Typically, the surface layer is friable, very dark brown fine sandy loam about 9 inches thick. The subsoil is firm, mottled, olive gray fine sandy loam about 9 inches thick. The substratum is mottled, firm, olive and olive brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Woodbridge and Whitman soils. Also included are areas of soils with a substratum of loamy sand. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the subsoil and slow or very slow in the substratum. Available water capacity is low, and reaction ranges from very strongly acid to medium acid. The rooting zone extends to the substratum, but root growth is restricted by a seasonal high water table which is at or near the surface in winter and spring.

Most areas of this soil have been farmed, but most of the previously cleared areas have reverted to trees and brush.

This soil is suitable for cultivated crops, hay, and pasture. The seasonal high water table keeps the soil saturated through late spring. The erosion hazard is moderate. The main management needs include installing field drains where feasible, proper timing of farming operations, erosion control, and the use of water-tolerant plant species. The use of proper stocking rates, deferred grazing, pasture rotation, and restricted grazing when the soil is saturated help maintain desirable pasture plant species.

The soil is suitable for trees and most types of wildlife habitat, but the seasonal high water table limits recreational and residential development and limits use of the soil as a site for waste disposal facilities.

This unit is in capability subclass IIIw.

RIA—Ridgebury and Leicester extremely stony fine sandy loams, 0 to 3 percent slopes. These deep, nearly level, poorly drained soils are in depressions and along drainageways. The soils are in oval and long and narrow areas that generally range from 5 to 50 acres. The surface of the areas is covered by stones 1 to 3 feet in diameter that are 10 to 100 feet apart. Slopes are smooth and concave. Some areas of these soils are dominantly Ridgebury soils, some are dominantly Leicester soils, and some are both. The soils were mapped together because they have no major differences in use and management. The mapped acreage of this unit is about 50 percent Ridgebury soils, 35 percent Leicester soils, and 15 percent other soils.

Typically, the Ridgebury soils have a surface layer of friable, very dark brown fine sandy loam about 5 inches thick. The subsoil is mottled, firm, olive gray fine sandy loam about 13 inches thick. The substratum is mottled, firm, olive and olive brown fine sandy loam to a depth of 60 inches or more.

Typically, the Leicester soils have a surface layer of friable, very dark gray fine sandy loam about 5 inches thick. The subsoil is mottled, friable, olive and olive gray fine sandy loam 23 inches thick. The substratum is mottled, firm, olive gray gravelly fine sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are areas of Woodbridge, Sutton, and Whitman soils.

Permeability is moderate to moderately rapid in the subsoil of both these soils. It is slow or very slow in the substratum of the Ridgebury soils and moderately rapid in the substratum of the Leicester soils. Available water capacity is low in the Ridgebury soils and moderate in the Leicester soils. Reaction ranges from very strongly acid to medium acid in the Ridgebury soils and very strongly acid or strongly acid in the Leicester soils. The rooting zone extends to the substratum in the Ridgebury soils and into the substratum in the Leicester soils, but root growth is restricted by a seasonal high water table which is at or near the surface in winter and spring.

These soils are suitable for trees and woodland and wetland wildlife habitat, and most areas are in woodland and shrubs. The seasonal high water table and stones on the surface make the soils poorly suited to farming and limit recreational development.

The seasonal high water table and stones on the surface also limit the soil for residential development and as a site for waste disposal facilities. The slow and very slow permeability in the substratum of the Ridgebury

soils and the moderately rapid permeability in the substratum of the Leicester soils are additional limitations for waste disposal facilities.

This unit is in capability subclass VIIs.

RIB—Ridgebury and Leicester extremely stony fine sandy loams, 3 to 8 percent slopes. These deep, gently sloping, poorly drained soils are in depressions and along drainageways. Slopes are smooth and concave. The soils are in oval and long and narrow areas that generally range from 5 to 50 acres. The surface of the areas is covered by stones 1 to 3 feet in diameter that are 10 to 100 feet apart. Some areas of these soils are dominantly Ridgebury soils, some are dominantly Leicester soils, and some are both. The soils were mapped together because they have no major differences in use and management. The mapped acreage of this unit is about 50 percent Ridgebury soils, 35 percent Leicester soils, and 15 percent other soils.

Typically, the Ridgebury soils have a surface layer of friable, very dark brown fine sandy loam about 5 inches thick. The subsoil is mottled, firm, olive gray fine sandy loam about 13 inches thick. The substratum is mottled, firm, olive and olive brown fine sandy loam to a depth of 60 inches or more.

Typically, the Leicester soils have a surface layer of friable, very dark gray fine sandy loam about 5 inches thick. The subsoil is mottled, friable, olive and olive gray fine sandy loam 23 inches thick. The substratum is mottled, firm, olive gray gravelly fine sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are areas of Woodbridge, Sutton, and Whitman soils. Also included are a few areas of soils with slopes of 8 to 15 percent.

Permeability is moderate to moderately rapid in the subsoil of both these soils. It is slow or very slow in the substratum of the Ridgebury soils and moderately rapid in the substratum of the Leicester soils. Available water capacity is low in the Ridgebury soils and moderate in the Leicester soils. Reaction ranges from very strongly acid to medium acid in the Ridgebury soils and very strongly acid or strongly acid in the Leicester soils. The rooting zone extends to the substratum in the Ridgebury soils and into the substratum in the Leicester soils, but root growth is restricted by a seasonal high water table which is at or near the surface in winter and spring.

These soils are suitable for trees and woodland wildlife habitat, and most areas are in woodland and shrubs. The seasonal high water table and stones on the surface make the soils poorly suited to farming and limit recreational development.

The seasonal high water table and stones on the surface also limit the soil for residential development and as a site for waste disposal facilities. The slow or very slow permeability in the substratum of the Ridgebury soils and the moderately rapid permeability in the substratum of the Leicester soils are additional limitations for waste disposal facilities.

This unit is in capability subclass VIIs.

RnC—Rock outcrop-Buxton complex, 3 to 15 percent slopes. This complex consists of areas of exposed bedrock and undulating and rolling, moderately well drained soils in irregularly shaped areas along the major streams in the survey area. The areas of exposed bedrock are less than 50 feet apart. The areas of the complex range from 5 to 40 acres, and most have stones and boulders on the surface. Slopes range from 100 to 400 feet long. The soils and exposed bedrock are so intermingled that it was not practical to map them separately. The complex is about 50 percent Rock outcrop, 35 percent Buxton soils, and 15 percent other soils.

Typically, the Buxton soils have a surface layer of friable, very dark grayish brown silt loam about 4 inches thick. The subsoil is 26 inches thick. It is friable, light olive brown silt loam in the upper 18 inches and firm, mottled, light olive brown silty clay loam in the lower 8 inches. The substratum is firm, mottled, light yellowish brown silty clay to a depth of 60 inches or more.

Included with this complex in mapping are small areas of Suffield and Scantic soils.

The permeability of the Buxton soils is moderately slow in the subsoil and slow in the substratum. Available water capacity is high. Reaction of the soil is strongly acid to slightly acid in the subsoil and medium acid to neutral in the substratum. The rooting zone extends through the subsoil, but root growth is restricted by a seasonal high water table which is in the lower part of the subsoil during winter and early spring.

Most areas of this complex are in woodland, and the complex is suitable for trees and woodland wildlife habitat. The areas of exposed bedrock interfere with timber harvesting equipment. The exposed bedrock and the stones on the surface make the complex poorly suited to farming and limit recreational development.

A few areas of the complex are used for residential development, but the complex is limited for this use and for waste disposal facilities by the areas of exposed bedrock, the seasonal high water table, and a susceptibility to frost action.

This unit is in capability subclass VIIs.

RnD—Rock outcrop-Buxton complex, 15 to 25 percent slopes. This complex consists of areas of exposed bedrock and moderately steep, moderately well drained soils in irregularly shaped areas along the major streams in the survey area. The areas of exposed bedrock are less than 50 feet apart. The areas of the complex range from 5 to 40 acres, and most have stones and boulders on the surface. Slopes range from 100 to 400 feet long. The soils and exposed bedrock are so intermingled that it was not practical to map them separately. The com-

plex is about 50 percent Rock outcrop, 35 percent Buxton soils, and 15 percent other soils.

Typically, the Buxton soils have a surface layer of friable, very dark grayish brown silt loam about 4 inches thick. The subsoil is 22 inches thick. It is friable, light olive brown silt loam in the upper 14 inches and firm, mottled, light olive brown silty clay loam in the lower 8 inches. The substratum is firm, mottled, light yellowish brown silty clay to a depth of 60 inches or more.

Included with this complex in mapping are small areas of Suffield and Scantic soils.

The permeability of the Buxton soils is moderately slow in the subsoil and slow in the substratum. Available water capacity is high. Reaction of the soil is strongly acid to slightly acid in the subsoil and medium acid to neutral in the substratum. The rooting zone extends through the subsoil, but root growth is restricted by a seasonal high water table which is in the lower part of the subsoil during winter and early spring.

Most areas of this complex are in woodland, and the complex is suitable for trees, woodland wildlife habitat, and openland wildlife habitat. The areas of exposed bedrock interfere with timber harvesting equipment. The exposed bedrock and the stones on the surface make the complex poorly suited to farming and limit recreational development.

A few areas of the complex are used for residential development, but the complex is limited for this use and for waste disposal facilities by the areas of exposed bedrock, the seasonal high water table, and a susceptibility to frost action.

This unit is in capability subclass VIIs.

RoC—Rock outcrop-Charlton-Hollis complex, 3 to 15 percent slopes. This complex is on undulating and rolling ridges and hills. It consists of exposed bedrock; well drained, deep Charlton soils; and somewhat excessively drained, shallow Hollis soils. The areas are irregularly shaped and range from 15 to 200 acres. Slopes range from 40 to 400 feet long. The areas of exposed bedrock are 10 to 30 feet apart. The surface of the complex is covered by stones that are 1 to 3 feet in diameter and that are also 10 to 30 feet apart. The complex consists of about 40 percent Rock outcrop, 30 percent Charlton soils, 15 percent Hollis soils, and 15 percent other soils. The soils and exposed rock are so intermingled that it was not practical to map them separately.

Typically, the Charlton soils have a surface layer of very friable, dark brown fine sandy loam about 4 inches thick. The subsoil is 24 inches thick. It is friable, brown fine sandy loam in the upper 7 inches and friable, dark yellowish brown gravelly fine sandy loam in the lower 17 inches. The substratum is friable, olive brown gravelly fine sandy loam to a depth of 60 inches or more.

Typically, the Hollis soils have a surface layer of friable, very dark brown fine sandy loam about 5 inches thick. The subsoil is brown and dark yellowish brown, friable fine sandy loam 11 inches thick. Hard granite bedrock is at a depth of 16 inches.

Included with this complex in mapping are small areas of Sutton and Leicester soils. Also included are soils with bedrock between depths of 20 and 40 inches.

Permeability is moderate or moderately rapid in the Charlton and Hollis soils. Available water capacity is moderate in the Charlton soils and very low in the Hollis soils. Reaction is very strongly acid to medium acid in both. The rooting zone extends into the substratum in the Charlton soils and to the bedrock in the Hollis soils.

Most areas of this complex are wooded. The Charlton soils are suitable for trees and woodland wildlife habitat, but the Hollis soils are poorly suited to these uses.

The areas of exposed bedrock and the stones on the surface make this complex poorly suited to farming and are the main limitations for recreational development.

The complex is limited for residential development and as a site for waste disposal facilities by the shallow depth to bedrock in the Hollis soils, the moderate or moderately rapid permeability of both soils, and the stones on the surface.

This unit is in capability subclass VIIs.

RoD—Rock outcrop-Charlton-Hollis complex, 15 to 35 percent slopes. This complex is on ridges and hills. It consists of exposed bedrock; well drained, deep Charlton soils; and somewhat excessively drained, shallow Hollis soils. The areas are irregularly shaped and range from 15 to 250 acres. Slopes range from 100 to 500 feet long. The areas of exposed bedrock are 10 to 30 feet apart. The surface of the complex is covered by stones that are 1 to 3 feet in diameter and that are also 10 to 30 feet apart. The complex consists of about 40 percent Rock outcrop, 30 percent Charlton soils, 15 percent Hollis soils, and 15 percent other soils. The soils and exposed rock are so intermingled that it was not practical to map them separately.

Typically, the Charlton soils have a surface layer of very friable, dark brown fine sandy loam about 4 inches thick. The subsoil is 24 inches thick. It is friable, dark brown fine sandy loam in the upper 7 inches and friable, dark yellowish brown gravelly fine sandy loam in the lower 17 inches. The substratum is friable olive brown gravelly fine sandy loam to a depth of 60 inches or more.

Typically, the Hollis soils have a surface layer of friable, very dark brown fine sandy loam about 5 inches thick. The subsoil is friable, brown and dark yellowish brown fine sandy loam 11 inches thick. Hard granite bedrock is at a depth of 16 inches.

Included with this complex in mapping are small areas of Sutton and Leicester soils. Also included are areas of soils with bedrock between depths of 20 and 40 inches.

Permeability is moderate or moderately rapid in the Charlton and Hollis soils. Available water capacity is

moderate in the Charlton soils and very low in the Hollis soils. Reaction is very strongly acid to medium acid in both. The rooting zone extends into the substratum in the Charlton soils and to the bedrock in the Hollis soils.

Most areas of this complex are wooded. The Charlton soils are suitable for trees and woodland wildlife habitat, but the Hollis soils are poorly suited to these uses.

The areas of exposed bedrock, the stones on the surface, and slope make this complex poorly suited to farming and are the main limitations for recreational development.

The complex is limited for residential development and as a site for waste disposal facilities by the shallow depth to bedrock of the Hollis soils, the stones on the surface, slope, and the moderately rapid or rapid permeability of the soils.

This unit is in capability subclass VIIs.

Rx—Rock outcrop-Hollis complex. This complex consists of exposed bedrock and somewhat excessivly drained, shallow, nearly level to steep Hollis soils on ridges and hills. The areas are irregularly shaped and range from 10 to 50 acres. Slopes are 40 to 500 feet long and range from 0 to 40 percent. The areas of exposed bedrock are mainly less than 10 feet apart, and stones are scattered on the surface of some areas of the complex. The complex consists of about 65 percent Rock outcrop, 20 percent Hollis soils, and 15 percent other soils. The soils and exposed rock are so intermingled that it was not practical to map them separately.

Typically, the Hollis soils have a surface layer of friable, very dark brown fine sandy loam about 5 inches thick. The subsoil is friable, brown and dark yellowish brown fine sandy loam 11 inches thick. Hard granite is at a depth of 16 inches.

Included with this complex in mapping are small areas of well drained soils that have bedrock between depths of 20 and 40 inches in some places and between depths of 2 and 8 inches in others.

The permeability of the Hollis soils is moderate or moderately rapid. Available water capacity is very low, and reaction ranges from very strongly acid to medium acid. The rooting zone extends to the bedrock.

Most areas of this unit are a mixture of bare rocks and woodland. The numerous bedrock exposures and shallow depth to bedrock limit this complex for most uses other than for esthetic value and some types of recreation.

This unit is in capability subclass VIIIs.

Sa—Saco Variant silt loam. This deep, nearly level, very poorly drained soil is on flood plains. Areas of this soil are irregular in shape or crescent shaped and range from 5 to 30 acres. These areas are near stream level and are commonly flooded at least once in 2 years.

Typically, the surface layer is friable, very dark gray silt loam about 5 inches thick. The substratum extends to a depth of 60 inches or more. It is mottled, friable, gray silt loam to a depth of 20 inches; loose, dark gray loamy fine sand to a depth of 30 inches; and very friable, gray fine sand and sand and thin layers of very dark grayish brown muck at a depth of more than 30 inches.

Included with this soil in mapping are small areas of Limerick and Rumney soils and Medisaprists, shallow. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderate in the upper part of the substratum and rapid in the lower part. Available water capacity is high. Reaction ranges from very strongly acid to medium acid in the upper part of the substratum and medium acid or slightly acid in the lower part. The rooting zone is primarily in the surface layer, and root growth is restricted by a seasonal high water table which is at or near the surface during most of the year.

Most areas of this soil are covered with water-tolerant weeds, sedges, grasses, and shrubs.

The hazard of flooding and the seasonal high water table make this soil poorly suited to farming and are major limitations for most uses except as wetland wildlife habitat. A high susceptibility to frost action is an additional limitation for residential development.

This unit is in capability subclass VIw.

ScA—Scantic silt loam, 0 to 3 percent slopes. This deep, nearly level, poorly drained soil is in depressions and along drainageways. The areas are irregular in shape and elongated and mainly range from 5 to 30 acres. Slopes are smooth and concave and are 100 to 400 feet long.

Typically, the surface layer is friable, dark grayish brown silt loam 6 inches thick. The subsurface layer is friable, mottled, grayish brown silt loam 5 inches thick. The subsoil is 15 inches thick and is mottled throughout. The upper 3 inches is firm, light gray silt loam; the lower 12 inches is firm, light gray and gray silty clay loam. The substratum is very firm, gray, mottled clay to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Buxton and Maybid soils that make up about 15 percent of this map unit.

The permeability of this soil is slow or very slow. Available water capacity is high. Reaction ranges from strongly acid to neutral in the subsoil and medium acid to neutral in the substratum. The rooting zone extends into the subsoil, but root growth is restricted by a seasonal high water table which is within 12 inches of the surface in winter and spring.

Most areas of this soil are covered with grass or are in woodland, but the soil is poorly suited to tree production.

This soil is suited to cultivated crops, hay, and pasture. The seasonal high water table is the main limitation for these uses, and drainage is difficult because of the slow or very slow permeability and a lack of outlets. The use

of proper stocking rates, deferred grazing, pasture rotation, and restricted grazing when the soil is saturated help maintain desirable pasture plant species.

The soil is suitable for most types of wildlife habitat, but the seasonal high water table is a limitation for recreational development.

The seasonal high water table limits the soil for residential development and as a site for waste disposal facilities. A high frost action potential is an additional limitation for residential development, and the slow or very slow permeability for waste disposal facilities.

This unit is in capability subclass IVw.

ScB—Scantic silt loam, 3 to 8 percent slopes. This deep, gently sloping, poorly drained soil is in depressions and along drainageways. The areas are irregular in shape and elongated and mainly range from 5 to 30 acres. Slopes are smooth and concave and are 100 to 400 feet long.

Typically, the surface layer is friable, dark grayish brown silt loam 6 inches thick. The subsurface layer is mottled, friable, grayish brown silt loam 5 inches thick. The subsoil is 15 inches thick and is mottled throughout. The upper 3 inches is firm, light gray silt loam; the lower 12 inches is firm, light gray and gray silty clay loam. The substratum is very firm, mottled, gray clay to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Buxton and Maybid soils that make up about 15 percent of this map unit.

The permeability of this soil is slow or very slow. Available water capacity is high. Reaction ranges from strongly acid to neutral in the subsoil and medium acid to neutral in the substratum. The rooting zone extends into the subsoil, but root growth is restricted by a seasonal high water table which is within 12 inches of the surface in winter and spring.

Most areas of this soil are covered with grass or are in woodland, but the soil is poorly suited to tree production.

This soil is suited to cultivated crops, hay, and pasture. The seasonal high water table is the main limitation for these uses, and drainage is difficult because of the slow or very slow permeability and a lack of outlets. The use of proper stocking rates, deferred grazing, pasture rotation, and restricted grazing when the soil is saturated help maintain desirable pasture plant species.

The soil is suitable for openland and woodland wildlife habitat, but the seasonal high water table is a limitation for recreational development.

The seasonal high water table limits the soil for residential development and as a site for waste disposal facilities. A high frost action potential is an additional limitation for residential development, and the slow or very slow permeability for waste disposal facilities.

This unit is in capability subclass IVw.

Se—Scarboro mucky fine sandy loam. This deep, very poorly drained, nearly level soil is in depressions. The areas are mainly irregular in shape and range from 5 to 40 acres.

Typically, the surface is covered with a 6-inch organic layer which is dark reddish gray and pinkish gray peat in the upper 2 inches and black muck in the lower 4 inches. The surface layer is very friable, very dark gray mucky fine sandy loam about 5 inches thick. The subsurface layer is mottled, gray loamy sand about 11 inches thick. The substratum is very friable and extends to a depth of 60 inches or more. It is mottled, gray loamy sand to a depth of 26 inches and light gray fine sand at a depth of more than 26 inches.

Included with this soil in mapping are small areas of Medisaprists and Wareham and Deerfield soils that make up about 15 percent of this map unit.

The permeability of this soil is rapid, and available water capacity is moderate. Reaction is very strongly acid to medium acid. The rooting zone is limited by a seasonal high water table which is at or near the surface during most of the year.

Most areas of this soil are in woodland, but the soil is poorly suited to tree production. Some areas are used as cropland, and a few are used for pasture.

The seasonal high water table makes this soil poorly suited to farming and is a major limitation for most uses of the soil except as wetland wildlife habitat.

This unit is in capability subclass Vw.

SgB—Scituate fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, moderately well drained soil is typically on the tops of drumlins and on foot slopes. Slopes are smooth and slightly concave and are 200 to 500 feet long. The soil is in oval areas that range from 10 to 30 acres on the tops of drumlins and is in irregularly shaped and long and narrow areas that range from 5 to 50 acres on foot slopes.

Typically, the surface layer is very friable, very dark grayish brown fine sandy loam about 10 inches thick. The subsoil is fine sandy loam 19 inches thick. It is very friable and yellowish brown in the upper 8 inches and is friable and mottled light olive brown in the lower 11 inches. The substratum is firm, olive gray, mottled loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Ridgebury and Whitman soils. Also included are areas of soils with slopes of 0 to 3 percent, areas with a few stones on the surface, and areas with rock outcrops more than 200 feet apart. Included soils make up about 25 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and slow in the substratum. Available water capacity is moderate, and reaction ranges from very strongly acid to medium acid. The rooting zone extends to the substratum, but root growth is restricted by a seasonal perched water table in the lower part of the

subsoil. This soil is wet throughout the early part of spring, often in late spring, and sometimes in the fall.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some of the acreage still is farmed, and some is in residential development.

This soil is well suited to cultivated crops, hay, and pasture. Wetness is a main limitation, and the erosion hazard is moderate. Good tilth is easily maintained in cultivated areas. The main management needs include erosion control and drainage. Where this soil is farmed, minimum tillage and the use of cover crops and grasses and legumes in the cropping system help to reduce runoff and control erosion. Mixing crop residue and manure into the surface layer improves tilth and increases organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for trees and openland wildlife habitat and has few limitations for picnic areas and trails. Slow permeability is a limitation for camp areas and playgrounds.

The slow permeability in the substratum, the seasonal perched water table, and a susceptibility to frost action limit the soil for residential development and as a site and for waste disposal facilities. Lateral water movement along the top of the substratum causes seepage in some excavations.

This unit is in capability subclass IIw.

SgC—Scituate fine sandy loam, 8 to 15 percent slopes. This deep, moderately sloping, moderately well drained soil is typically on the sides of drumlins and ridges. The soil is in rectangular areas that range from 5 to 20 acres and is in irregularly shaped areas that range from 10 to 40 acres. Slopes are smooth or rolling, slightly concave, and 100 to 400 feet long.

Typically, the surface layer is very friable, and very dark grayish brown fine sandy loam about 10 inches thick. The subsoil is fine sandy loam 17 inches thick. It is very friable and yellowish brown in the upper 6 inches and is friable and mottled light olive brown in the lower 11 inches. The substratum is olive gray, mottled, firm loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Ridgebury, Hollis, and Montauk soils. Also included are areas with a few stones on the surface and areas with rock outcrops more than 200 feet apart. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and slow in the substratum. Available water capacity is moderate, and reaction ranges from very strongly acid to medium acid. The rooting zone extends to the substratum, but root growth is restricted by a seasonal perched water table in the lower part of the subsoil. This soil is wet throughout the early part of spring, often in late spring, and sometimes in the fall.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some of the acreage still is farmed, and some is in residential development.

The soil is suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas. A moderately severe erosion hazard and wetness are the main limitations. Where this soil is farmed, minimum tillage and the use of cover crops and grasses and legumes in the cropping system help to reduce runoff and control erosion. Mixing crop residue and manure into the surface layer improves tilth and increases the organic matter content of this soil. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

The soil is suitable for trees and openland wildlife habitat and has few limitations for trails. Slope and the slow permeability in the substratum are limitations for most other types of recreational development.

The slow permeability in the substratum, the seasonal perched water table, a susceptibility to frost action, and slope limit the soil for residential development and as a site for waste disposal facilities.

This unit is in capability subclass IIIe.

ShB—Scituate very stony fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, moderately well drained soil is mainly on the tops and sides of drumlins. The areas are irregular in shape and range from 5 to 50 acres. Slopes are smooth or undulating, are slightly concave, and are 200 to 600 feet long. The surface is covered by stones 1 to 3 feet in diameter that are 30 to 100 feet apart.

Typically, the surface layer is very friable, very dark grayish brown fine sandy loam about 5 inches thick. The subsoil is fine sandy loam 22 inches thick. It is very friable and yellowish brown in the upper 11 inches and is friable and mottled light olive brown in the lower 11 inches. The substratum is firm, olive gray, mottled loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Ridgebury and Whitman soils. Also included are areas of soils with slopes of 0 to 3 percent and areas with rock outcrops more than 200 feet apart. Included soils make up about 25 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and slow in the substratum. Available water capacity is moderate, and reaction ranges from very strongly acid to medium acid. The rooting zone extends to the substratum, but root growth is restricted by a seasonal perched water table in the lower part of the subsoil. This soil is wet throughout the early part of spring, often in late spring, and sometimes in the fall.

Most areas of this soil are in woodland. Some areas are in residential development.

The stones on the surface make the soil poorly suited to cultivated crops. The use of proper stocking rates,

deferred grazing, and pasture rotation help maintain desirable pasture plant species.

This soil is suitable for trees and woodland wildlife habitat, but the stones on the surface and the slow permeability of the substratum limit the soil for most recreational uses other than picnic areas.

The soil is limited for residential development and as a site for waste disposal facilities by the slow permeability of the substratum, the seasonal perched water table, and a susceptibility to frost action.

This unit is in capability subclass VIs.

ShC—Scituate very stony fine sandy loam, 8 to 15 percent slopes. This deep, moderately sloping, moderately well drained soil is mainly on the sides of drumlins and ridges. The areas are irregular in shape and range from 10 to 40 acres. Slopes are smooth or rolling, are slightly concave, and are 200 to 500 feet long. The surface is covered by stones 1 to 3 feet in diameter that are 30 to 100 feet apart.

Typically, the surface layer is very friable, very dark grayish brown fine sandy loam about 4 inches thick. The subsoil is fine sandy loam 24 inches thick. It is very friable and yellowish brown in the upper 11 inches and is friable and mottled light olive brown in the lower 13 inches. The substratum is firm, olive gray, mottled loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Ridgebury, Hollis, and Montauk soils that make up about 15 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and slow in the substratum. Available water capacity is moderate, and reaction ranges from very strongly acid to medium acid. The rooting zone extends to the substratum, but root growth is restricted by a seasonal perched water table in the lower part of the subsoil. This soil is wet throughout the early part of spring, often in late spring, and sometimes in the fall.

Most areas of this soil are in woodland. A few areas are in residential development.

The stones on the surface make the soil poorly suited to cultivated crops. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for trees and woodland wildlife habitat, but slope and the stones on the surface limit recreational development.

The slow permeability in the substratum, the seasonal perched water table, and a susceptibility to frost action limit use of the soil for residential development and as a site for waste disposal facilities.

This unit is in capability subclass VIs.

SrA—Sudbury fine sandy loam, 0 to 3 percent slopes. This deep, nearly level, moderately well drained soil is on outwash plains. The areas are irregular in shape and range from 5 to 25 acres. Slopes are 100 to 500 feet long.

Typically, the surface layer is very friable, very dark brown fine sandy loam about 4 inches thick. The subsoil is 22 inches thick and is very friable throughout. The upper 4 inches is dark yellowish brown fine sandy loam, the next 12 inches is yellowish brown sandy loam, and the lower 6 inches is yellowish brown, mottled loamy sand. The substratum is mottled, loose, yellowish brown stratified sand and gravel to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Merrimac and Walpole soils that make up about 20 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and rapid in the substratum. Available water capacity is moderate, and reaction ranges from extremely acid to medium acid. The rooting zone extends into the substratum, but root growth is restricted by a seasonal high water table which is in the lower part of the subsoil during winter and spring.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Many areas are still farmed, and some are in urban and residential development.

This soil is well suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas, and the erosion hazard is slight. Wetness is the major limitation. The main management needs include installing field drains where needed, improving tilth, and increasing organic matter content. Where this soil is farmed, the use of cover crops and grasses and legumes in the cropping system and mixing crop residue and manure into the surface layer help improve tilth and increase organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for trees and for openland and woodland wildlife habitat. It has few limitations for most recreational developments, but the seasonal high water table is a limitation for playgrounds.

The seasonal high water table, seepage, and a susceptibility to frost action limit the soil for most types of residential development and as a site for sanitary waste disposal facilities.

This unit is in capability subclass IIw.

SrB—Sudbury fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, moderately well drained soil is on outwash plains. The areas are irregular in shape and range from 5 to 25 acres. Slopes are 100 to 400 feet long.

Typically, the surface layer is very friable, very dark brown fine sandy loam about 4 inches thick. The subsoil is 22 inches thick and is very friable throughout. The upper 4 inches is dark yellowish brown fine sandy loam, the next 12 inches is yellowish brown sandy loam, and

the lower 6 inches is yellowish brown, mottled loamy sand. The substratum is loose, mottled, yellowish brown stratified sand and gravel to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Merrimac and Walpole soils that make up about 20 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and rapid in the substratum. Available water capacity is moderate, and reaction ranges from extremely acid to medium acid. The rooting zone extends into the substratum, but root growth is restricted by a seasonal high water table which is in the lower part of the subsoil during winter and spring.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Many areas still are farmed, and some are in urban and residential development.

This soil is well suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas. The erosion hazard is moderate, and wetness is a major limitation. The main management needs include installing field drains where needed, controlling erosion, improving tilth, and increasing organic matter content. Where this soil is farmed, minimum tillage and the use of cover crops and grasses and legumes in the cropping system help reduce runoff and control erosion. Mixing crop residue and manure into the surface layer improves tilth and increases the organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for trees, woodland wildlife habitat, and openland wildlife habitat. It has few limitations for most types of recreation, but slope and the seasonal high water table limit its use for playgrounds.

The seasonal high water table, seepage, and a susceptibility to frost action limit the soil for residential development and as a site for waste disposal facilities.

This unit is in capability subclass IIw.

SsB—Suffield silt loam, 3 to 8 percent slopes. This deep, gently sloping, well drained soil is in irregularly shaped areas that range from 5 to 15 acres. Slopes are undulating and are 50 to 100 feet long.

Typically, the surface layer is friable, dark brown silt loam about 7 inches thick. The subsoil is light olive brown silt loam 28 inches thick. It is friable in the upper part, firm in the middle part, and very firm in the lower part. The substratum extends to a depth of 60 inches or more. It is very firm and sticky, light olive brown silty clay and has very thin layers of silt, clay, and very fine sand.

Included with this soil in mapping are small areas of Buxton and Scantic soils. Also included are a few areas of soils where the surface layer is loam. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderate in the subsoil and slow in the substratum. Available water capacity is high. Reaction is strongly acid to slightly acid in the subsoil and medium acid to neutral in the substratum. The rooting zone extends into the substratum.

Most areas of this soil are farmed. Some areas are in woodland, and some are in residential development.

This soil is well suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas. The erosion hazard is moderate. Where this soil is farmed, stripcropping, minimum tillage, and the use of cover crops and grasses and legumes in the cropping system help reduce runoff and control erosion. Mixing crop residue and manure into the surface layer improves tilth and increases the organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for trees, openland wildlife habitat, and woodland wildlife habitat. The slow permeability in the substratum is a limitation for some recreational uses.

The slow permeability and clayey texture of the substratum and a susceptibility to frost action limit the soil for residential development and as a site for waste disposal facilities.

This unit is in capability subclass IIe.

SsC—Suffield silt loam, 8 to 15 percent slopes. This deep, moderately sloping, well drained soil is in irregularly shaped areas that range from 5 to 15 acres. Slopes are 50 to 100 feet long.

Typically, the surface layer is friable, dark brown silt loam about 7 inches thick. The subsoil is light olive brown silt loam 28 inches thick. It is friable in the upper part, firm in the middle part, and very firm in the lower part. The substratum extends to a depth of 60 inches or more. It is very firm, light olive brown silty clay and has very thin layers of silt, clay, and very fine sand.

Included with this soil in mapping are small areas of Buxton soils. Also included are areas of soils with slopes of 15 to 25 percent. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderate in the subsoil and slow in the substratum. Available water capacity is high. Reaction is strongly acid to slightly acid in the subsoil and medium acid to neutral in the substratum. The rooting zone extends into the substratum.

Most areas of this soil are farmed. Some areas are in woodland, and some are in residential development.

This soil is suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas. The erosion hazard is moderately severe. Where this soil is farmed, stripcropping, minimum tillage, and the use of cover crops and grasses and legumes in the cropping system help reduce runoff and control erosion. Mixing crop residue and manure into the surface layer improves tilth and increases the organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for trees, openland wildlife habitat, and woodland wildlife habitat. Slope and the slow permeability in the substratum limit some recreational uses.

The clayey texture and slow permeability of the substratum and a susceptibility to frost action limit the soil for residential development and as a site for waste disposal facilities.

This unit is in capability subclass IIIe.

StA—Sutton fine sandy loam, 0 to 3 percent slopes. This deep, nearly level, moderately well drained soil is on the tops of hills and in broad flats. The areas range from 5 to 15 acres.

Typically, the surface layer is friable, very dark grayish brown fine sandy loam about 9 inches thick. The subsoil is 17 inches thick. It is friable, yellowish brown fine sandy loam in the upper 13 inches and friable, light olive brown, mottled gravelly fine sandy loam in the lower 4 inches. The substratum is mottled, friable, light olive brown and light olive gray gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Leicester and Whitman soils and soils that are loamy sand throughout. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the subsoil and moderate to rapid in the substratum. Available water capacity is moderate. Reaction is very strongly acid to medium acid. The rooting zone extends into the substratum, but root growth is restricted by a seasonal high water table that is within 42 inches of the surface during winter and spring.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some of the areas still are farmed, and many are in urban and residential development.

This soil is well suited to cultivated crops, hay, and pasture. The seasonal high water table is the main limitation for these uses, and drainage is needed. Mixing crop residue and manure into the surface layer helps improve tilth and increase the organic matter content of the soil. The use of proper stocking rates, deferred grazing, pasture rotation, and restricted grazing when the soil is saturated help to maintain desirable pasture plant species.

The soil is suitable for trees, openland wildlife habitat, and woodland wildlife habitat. It is generally suitable for recreational development.

The seasonal high water table and a susceptibility to frost action limit the soil for residential development. The high water table, along with the moderate to rapid permeability in the substratum, also limits the soil as a site for waste disposal facilities.

This unit is in capability subclass IIw.

StB—Sutton fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, moderately well drained soil is on or near the tops of hills and ridges and in irregularly shaped areas at lower elevations. The areas range from 5 to 25 acres. Slopes are mainly smooth and slightly concave and are 100 to 400 feet long.

Typically, the surface layer is friable, very dark grayish brown fine sandy loam about 9 inches thick. The subsoil is 17 inches thick. It is friable, yellowish brown fine sandy loam in the upper 13 inches and friable light olive brown, mottled gravelly fine sandy loam in the lower 4 inches. The substratum is mottled, friable, light olive brown and light olive gray gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Leicester and Whitman soils and soils that are loamy sand throughout. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the subsoil and moderate to rapid in the substratum. Available water capacity is moderate. Reaction ranges from very strongly acid to medium acid. The rooting zone extends into the substratum, but root growth is restricted by a seasonal high water table that is within 42 inches of the surface during winter and spring.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some of the areas still are farmed, and many are in residential development.

This soil is well suited to cultivated crops, hay, and pasture. Erosion is a moderate hazard. The seasonal high water table is the main limitation, and drainage is needed. Mixing crop residue and manure into the surface layer improves tilth and increases the organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for trees, openland wildlife habitat, and woodland wildlife habitat. It has few limitations for most recreational developments, but slope is a limitation for playgrounds.

The seasonal high water table and a susceptibility to frost action limit residential development. Use of the soil as a site for most types of waste disposal facilities is limited by the moderate to rapid permeability in the substratum and the seasonal high water table.

This unit is in capability subclass IIw.

StC—Sutton fine sandy loam, 8 to 15 percent slopes. This deep, moderately sloping, moderately well drained soil is on the sides of hills and ridges and in irregularly shaped areas at lower elevations. The areas range from 5 to 25 acres. Slopes are typically smooth and slightly concave and are 100 to 400 feet long.

Typically, the surface layer is friable, very dark grayish brown fine sandy loam about 8 inches thick. The subsoil is 15 inches thick. It is friable, yellowish brown fine sandy loam in the upper 11 inches and friable, light olive brown, mottled gravelly fine sandy loam in the lower 4

inches. The substratum is mottled, friable, light olive brown and light olive gray gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Leicester soils, soils with slopes of 15 to 25 percent, and soils that are loamy sand throughout. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the subsoil and moderate to rapid in the substratum. Available water capacity is moderate. Reaction ranges from very strongly acid to medium acid. The rooting zone extends into the substratum but root growth is restricted by a seasonal high water table that is within 42 inches of the surface during winter and spring.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some of the areas still are farmed, and many are in residential development.

This soil is suited to cultivated crops, hay, and pasture. Erosion is a moderately severe hazard. The seasonal high water table is the main limitation, and drainage is needed. Mixing crop residue and manure into the surface layer improves tilth and increases the organic matter content of the soil. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for trees, openland wildlife habitat, and woodland wildlife habitat, but slope is a limitation for most recreational uses other than trails.

This soil is limited for residential development by the seasonal high water table, slope, and a susceptibility to frost action. It is limited as a site for most types of waste disposal facilities by the moderate to rapid permeability of the substratum and the seasonal high water table.

This unit is in capability subclass IIIe.

SuB—Sutton very stony fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, moderately well drained soil is in irregularly shaped areas on hills and on broad flats at lower elevations. The areas range from 5 to 50 acres and are covered by stones 1 to 3 feet in diameter that are 30 to 100 feet apart. Slopes are typically smooth, are slightly concave, and are 100 to 500 feet long.

Typically, the surface layer is friable, very dark grayish brown fine sandy loam about 9 inches thick. The subsoil is 17 inches thick. It is friable, yellowish brown fine sandy loam in the upper 13 inches and friable, light olive brown, mottled gravelly fine sandy loam in the lower 4 inches. The substratum is mottled, friable, light olive brown and light olive gray gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Leicester and Whitman soils. Also included are a few small areas of soils with slopes of 0 to 3 percent, areas where stones on the surface are 10 to 30 feet apart, and areas of soils that are loamy sand in the substratum. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the subsoil and moderate to rapid in the substratum. Available water capacity is moderate. Reaction ranges from very strongly acid to medium acid. The rooting zone extends into the substratum, but root growth is restricted by a seasonal high water table that is within 42 inches of the surface during winter and spring.

Many areas of this soil are in woodland. Some areas are in urban and residential development, and a few are used for pasture.

The stones on the surface make the soil poorly suited to cultivated crops. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for trees and woodland wildlife habitat. The stones on the surface limit most recreational uses other than picnic areas.

This soil is limited for residential development and as a site for waste disposal facilities by the moderate to rapid permeability in the substratum, the seasonal high water table, the stones on the surface, and a susceptibility to frost action.

This unit is in capability subclass VIs.

SuC—Sutton very stony fine sandy loam, 8 to 15 percent slopes. This deep, moderately sloping, moderately well drained soil is in irregularly shaped areas on the sides of hills and ridges and on broad flats at lower elevations. The areas range from 5 to 50 acres and are covered by stones 1 to 3 feet in diameter that are 30 to 100 feet apart. Slopes are mainly smooth, slightly concave, and 100 to 500 feet long.

Typically, the surface layer is friable, very dark grayish brown fine sandy loam about 9 inches thick. The subsoil is 17 inches thick. It is friable, yellowish brown fine sandy loam in the upper 13 inches and friable, light olive, mottled gravelly fine sandy loam in the lower 4 inches. The substratum is mottled, friable, light olive brown and light olive gray gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Leicester soils. Also included are a few small areas of soils that are loamy sand throughout, areas where the stones on the surface are 10 to 30 feet apart, and a few areas of soils with slopes of 15 to 25 percent. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the subsoil and moderate to rapid in the substratum. Available water capacity is moderate. Reaction ranges from very strongly acid to medium acid. The rooting zone extends into the substratum, but root growth is restricted by a seasonal high water table that is within 42 inches of the surface during winter and spring.

Most areas of this soil are in woodland. Some areas are in residential development, and a few are used for pasture.

The stones on the surface make this soil poorly suited to cultivated crops. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

The soil is suitable for trees and woodland wildlife habitat, but slope and the stones on the surface limit recreational development.

The stones on the surface, slope, the seasonal high water table, and a susceptibility to frost action limit the soil for residential development and as a site for waste disposal facilities.

This unit is in capability subclass VIs.

SwA—Swanton fine sandy loam, 0 to 3 percent slopes. This deep, nearly level, poorly drained soil is in depressions. The areas range from 5 to 20 acres. Slopes are smooth and are 100 to 300 feet long.

Typically, the surface layer is very dark brown and very dark grayish brown fine sandy loam about 8 inches thick. The subsoil is 20 inches thick. It is olive, mottled, friable fine sandy loam in the upper 11 inches and olive gray, mottled, firm fine sandy loam in the lower 9 inches. The substratum is mottled, olive, firm silty clay loam and silty clay to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Melrose and Whately Variant soils that make up about 15 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and slow in the substratum. Available water capacity is high. Reaction ranges from strongly acid to medium acid in the subsoil and from medium acid to neutral in the substratum. The rooting zone extends into the subsoil, but root growth is restricted by a seasonal high water table which is at or near the surface in winter and spring.

Many areas of this soil are in woodland, but the soil is poorly suited to tree production. Some areas are farmed, and a few are in residential and urban development.

This soil is suitable for cultivated crops, hay, and pasture. The seasonal high watertable keeps the soil saturated through late spring. The erosion hazard is slight. The main management needs include drainage, proper timing of farming operations, and the use of water-tolerant plant species. The use of proper stocking rates, deferred grazing, pasture rotation, and restricted grazing when the soil is saturated help maintain desirable pasture plant species.

The soil is suitable for most types of wildlife habitat, but the seasonal high water table is a limitation for recreational and residential development and limits the soil as a site for waste disposal facilities. A susceptibility to frost action is an additional limitation for residential development.

This unit is in capability subclass IIIw.

SwB—Swanton fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, poorly drained soil is in depressions. The areas range from 5 to 15 acres. Slopes are smooth and undulating and are 100 to 200 feet long.

Typically, the surface layer is very dark brown and dark grayish brown fine sandy loam about 8 inches thick. The subsoil is about 20 inches thick. It is olive, mottled, friable fine sandy loam in the upper 11 inches and olive gray, mottled, firm fine sandy loam in the lower 9 inches. The substratum is mottled, olive, firm silty clay loam and silty clay to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Melrose and Whately Variant soils that make up about 15 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and slow in the substratum. Available water capacity is high. Reaction ranges from strongly acid to medium acid in the subsoil and from medium acid to neutral in the substratum. The rooting zone extends into the subsoil, but root growth is restricted by a seasonal high water table which is at or near the surface in winter and spring.

Many areas of this soil are in woodland, but the soil is poorly suited to tree production. Some areas are farmed, and a few areas are in residential and urban development.

This soil is suitable for cultivated crops, hay, and pasture. The seasonal high water table keeps the soil saturated through late spring. The erosion hazard is moderate. The main management needs include drainage, proper timing of farming operations, use of water-tolerant plant species, and erosion control practices. The use of proper stocking rates, deferred grazing, pasture rotation, and restricted grazing when the soil is saturated help maintain desirable pasture plant species.

The soil is suitable for openland and woodland wildlife habitat, but the seasonal high water table is a limitation for recreational and residential development and limits the soil as a site for waste disposal facilities. A susceptibility to frost action is an additional limitation for residential development.

This unit is in capability subclass IIIw.

UAC—Udipsamments, rolling. These deep, gently sloping to very steep, excessively drained to moderately well drained soils are on sand dunes adjacent to coastal beaches and tidal marshes. The areas are irregular in shape and range from 10 to 850 acres.

Typically, the soil is loose, gray, light gray, and grayish brown sand to a depth of 60 inches or more.

Included with these soils in mapping are small areas of Ipswich and Westbrook soils and small areas of Scarboro soils. Also included are a few small areas in depressions that have a seasonal high water table at a depth of less than 4 feet, areas of Beaches, and a few

areas of Udorthents, smoothed. Included soils make up about 15 percent of this unit.

Permeability in these soils is rapid to very rapid, and available water capacity is very low. Reaction ranges from very strongly acid to slightly acid. The rooting zone extends throughout the soils.

Most areas of this unit are in grasses and shrubs. Some areas are used for residential development.

Droughtiness, slope, and exposure to salt spray make these soils poorly suited to farming and woodland. The sandy texture of the soils, slope, and the susceptibility to wind erosion limit the soils for recreational development. Most of the vegetation on these soils is fragile and easily destroyed by foot and vehicular traffic.

Slope limits the soils for residential development and as a site for waste disposal facilities. The instability of excavations in this soil is an additional limitation for residential development, and the very rapid permeability also limits the soils for waste disposal facilities.

This unit is not assigned to a capability subclass.

UD—Udorthents, smoothed. This unit consists of areas from which soil material has been excavated and areas where this material has been deposited. The original soils were typically excessively drained to moderately well drained and ranged from nearly level to steep. This unit is in elongated, irregularly shaped, and rectangular areas that range from 4 to 200 acres. The depth of excavation and fill material ranges from 2 to 20 feet. Some areas of this unit have a central portion that is level or nearly level and that has moderately sloping to steep margins. The texture of the soil material in this unit generally ranges from sand and gravel to fine sandy loam, but in some places it is loam or silt loam.

Included with this unit in mapping are areas of Urban land and Beaches. Also included are areas used for trash disposal. Included areas make up about 20 percent of this map unit.

The permeability of this unit ranges from slow to very rapid, and available water capacity ranges fom high to very low. Gravel and cobblestones are abundant in some areas of this unit, and stones and boulders in other areas.

Most areas of this unit are used for roads, highways, schools, shopping centers, and athletic fields. Most areas have structures on the level portion and vegetation on the slopes.

The characteristics and properties of this unit are variable, and onsite investigation is needed to determine the limitations and suitabilities for specified uses.

This unit is not assigned to a capability subclass.

UnA—Unadilla very fine sandy loam, 0 to 3 percent slopes. This deep, nearly level, well drained soil is in irregularly shaped areas that range from 10 to 15 acres.

Typically, the surface layer is very friable, very dark grayish brown very fine sandy loam about 9 inches thick. The subsoil is very friable, yellowish brown and light olive brown very fine sandy loam 20 inches thick. The substratum extends to a depth of 60 inches or more. It is very friable, light olive brown very fine sandy loam to a depth of 53 inches and olive loamy very fine sand at a depth of more than 53 inches.

Included with this soil in mapping are small areas of Belgrade and Raynham soils. Also included are a few small areas of soils with sand or gravel below a depth of 4 feet. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderate. Available water capacity is high, and reaction is very strongly acid to medium acid in unlimed areas. The rooting zone extends into the substratum.

Many areas of this soil have been farmed, and many are in residential and urban development.

This soil is well suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas, and the erosion hazard is slight. Where this soil is farmed, minimum tillage and the use of cover crops and grasses and legumes in the cropping system help maintain good tilth and increase the organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

This soil is suitable for trees, openland wildlife habitat, and woodland wildlife habitat. It is generally suitable for recreational and residential development and as a site for waste disposal facilities.

This unit is in capability class I.

UnB—Unadilla very fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, well drained soil is in irregularly shaped areas that range from 5 to 25 acres. Slopes are 50 to 200 feet long.

Typically, the surface layer is very friable, very dark grayish brown very fine sandy loam about 9 inches thick. The subsoil is very friable, yellowish brown and light olive brown very fine sandy loam 20 inches thick. The substratum extends to a depth of 60 inches or more. It is light olive brown, very friable very fine sandy loam to a depth of 53 inches and olive, very friable loamy very fine sand at a depth of more than 53 inches.

Included with this soil in mapping are small areas of Belgrade and Raynham soils. Also included are a few small areas of soils with sand or gravel below a depth of 4 feet. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderate. Available water capacity is high and reaction is very strongly acid or medium acid in unlimed areas. The rooting zone extends into the substratum.

Many areas of this soil have been farmed, and many are in residential and urban development.

This soil is well suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated

areas, and the erosion hazard is moderate. Where this soil is farmed, stripcropping, minimum tillage, and the use of cover crops and grasses and legumes in the cropping system help reduce runoff and control erosion. Mixing crops residue and manure into the surface layer improves tilth and increases organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for trees, openland wildlife habitat, and woodland wildlife habitat. It is generally suitable for residential development and as a site for waste disposal facilities. It is generally suitable for most types of recreational development, but slope is a limitation for playgrounds.

This unit is in capability subclass IIe.

UnC—Unadilla very fine sandy loam, 8 to 15 percent slopes. This deep, moderately sloping, well drained soil is in irregularly shaped areas that range from 5 to 25 acres. Slopes are 100 to 300 feet long.

Typically, the surface layer is very friable, very dark grayish brown very fine sandy loam about 8 inches thick. The subsoil is very friable, yellowish brown and light olive brown very fine sandy loam 16 inches thick. The substratum extends to a depth of 60 inches or more. It is light olive brown, very friable very fine sandy loam to a depth of 48 inches and olive, very friable loamy very fine sand at a depth of more than 48 inches.

Included with this soil in mapping are small areas of Belgrade soils. Also included are a few areas of steeper Unadilla soils and areas of soils with a subsoil of fine sandy loam. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderate. Available water capacity is high, and reaction is very strongly acid or medium acid in unlimed areas. The rooting zone extends into the substratum.

Most areas of this soil are farmed. Some areas are in woodland.

This soil is suited to cultivated crops, hay, and pasture. Good tilth is easily maintained in cultivated areas. The erosion hazard is moderately severe. Where this soil is farmed, stripcropping, terracing, minimum tillage, and the use of cover crops and grasses and legumes in the cropping system help to reduce runoff and control erosion. Mixing crop residue and manure into the surface layer improves tilth and increases the organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for trees, openland wildlife habitat, and woodland wildlife habitat. Slope limits the soil for residential development, as a site for waste disposal facilities, and for most recreational uses other than trails. Low strength and a susceptibility to frost action are additional limitations for residential development.

This unit is in capability subclass IIIe.

Ur—Urban land. Urban land consists of nearly level to moderately steep areas where the soils have been altered or obscured by urban works and structures. Buildings, industrial areas, paved areas, and railroad yards cover more than 75 percent of the land surface. The areas are irregular in shape and range from 2 acres to more than 1,000 acres.

Included with this unit in mapping are numerous small areas of Udorthents, smoothed. Also included are small areas of Paxton, Charlton, Hinckley, Windsor, and Merrimac soils. Included areas make up about 20 percent of the map unit.

The properties and characteristics of this unit are so variable that onsite investigation is needed to determine the limitations and suitabilities for specified uses.

This unit is not assigned to a capability subclass.

WaA—Walpole fine sandy loam, 0 to 3 percent slopes. This deep, nearly level, poorly drained soil is in low areas and depressions. Slopes are 100 to 600 feet long.

Typically, the surface layer is friable, very dark grayish brown fine sandy loam about 10 inches thick. The subsoil is mottled, friable, grayish brown sandy loam 14 inches thick. The substratum extends to a depth of 60 inches or more. It is very friable, olive, mottled gravelly loamy sand to a depth of 30 inches; grayish brown, mottled loamy sand to a depth of 36 inches; and loose, olive brown, mottled stratified sand, gravel, and gravelly sand at a depth of more than 36 inches.

Included with this soil in mapping are areas of Scarboro, Ninigret, and Sudbury soils that make up about 15 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and rapid in the substratum. Available water capacity is moderate, and reaction ranges from strongly acid to medium acid. The rooting zone extends into the substratum, but root growth is restricted by a seasonal high water table which is at or near the surface in winter and spring.

Most areas of this soil are in woodland. Some areas are in residential and urban development, and a few are used for pasture.

This soil is suited to cultivated crops, hay, and pasture. The seasonal high water table is the main limitation for these uses, and drainage is a major management need. The use of proper stocking rates, deferred grazing, pasture rotation, and restricted grazing when the soil is wet help to maintain desirable pasture plant species.

The soil is suitable for trees and wetland wildlife habitat. The seasonal high water table limits the soil for recreational and residential development and as a site for waste disposal facilities. A susceptibility to frost action is an additional limitation for residential develop-

ment, and the rapid permeability in the substratum for waste disposal facilities.

This unit is in capability subclass IIIw.

WaB—Walpole fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, poorly drained soil is in elongated and irregularly shaped areas that range from 5 to 60 acres. Slopes are 100 to 600 feet long.

Typically, the surface layer is friable, very dark grayish brown fine sandy loam about 10 inches thick. The subsoil is mottled, friable, grayish brown sandy loam 14 inches thick. The substratum extends to a depth of 60 inches or more. It is very friable, olive, mottled gravelly loamy sand to a depth of 30 inches; grayish brown, mottled loamy sand to a depth of 36 inches; and loose, olive brown, mottled stratified sand, gravel, and gravelly sand at a depth of more than 36 inches.

Included with this soil in mapping are areas of Scarboro, Ninigret, and Sudbury soils that make up about 15 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and rapid in the substratum. Available water capacity is moderate, and reaction ranges from strongly acid to medium acid. The rooting zone extends into the substratum, but root growth is restricted by a seasonal high water table which is at or near the surface in winter and spring.

Most areas of this soil are in woodland. Some areas have been drained and are farmed.

This soil is suited to cultivated crops, hay, and pasture. The seasonal high water table is the main limitation for these uses, and drainage is the main management need. The use of proper stocking rates, deferred grazing, pasture rotation, and restricted grazing when the soil is wet help to maintain desirable pasture plant species.

The soil is suitable for trees, openland wildlife habitat, and wetland wildlife habitat. The seasonal high water table limits use of the soil for recreational and residential development and as a site for waste disposal facilities. A susceptibility to frost action is an additional limitation for residential development, and the rapid permeability in the substratum for waste disposal facilities.

This unit is in capability subclass IIIw.

Wb—Walpole Variant fine sandy loam. This deep, nearly level, poorly drained soil is in elongated or irregularly shaped areas that range from 5 to 40 acres.

Typically, the surface layer is friable, very dark grayish brown fine sandy loam about 8 inches thick. The subsoil is mottled, friable, olive gray and grayish brown fine sandy loam 17 inches thick. The subsoil extends to a depth of 60 inches or more. It consists of very thin layers of light olive brown, mottled silt and light yellowish brown, mottled very fine sand.

Included with this soil in mapping are small areas of Amostown and Scarboro soils. Also included are a few small areas where the subsoil extends to a depth of 50 inches and a few small areas where slopes range from 3 to 8 percent. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and moderately slow in the substratum. Available water capacity is high. Reaction ranges from very strongly acid to medium acid in the subsoil and from strongly acid to slightly acid in the substratum. The rooting zone extends into the substratum, but root growth is restricted by a seasonal high water table that is at or near the surface in winter and spring.

Most areas of this soil are in woodland. Some areas are used for pasture, and a few are in residential and urban development.

This soil is suited to cultivated crops, hay, and pasture. The seasonal high water table is the main limitation for these uses. The soil is difficult to drain because of the moderately slow permeability in the substratum. The use of proper stocking rates, deferred grazing, pasture rotation, and restricted grazing when the soil is wet help to maintain desirable pasture plant species.

The soil is suitable for trees and wetland wildlife habitat. The seasonal high water table limits use of the soil for recreational and residential development and as a site for waste disposal facilities. A susceptibility to frost action is an additional limitation for residential development.

This unit is in capability subclass IIIw.

WeA—Wareham loamy sand, 0 to 3 percent slopes. This deep, nearly level, poorly drained soil is in irregularly shaped areas that range from 5 to 15 acres. Slopes are 100 to 200 feet long.

Typically, the surface layer is very friable, very dark brown loamy sand about 8 inches thick. The subsurface layer is very friable, light gray loamy sand 2 inches thick. The subsoil is friable, yellowish brown, mottled loamy sand 7 inches thick. The substratum is mottled, loose, dark grayish brown and grayish brown sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Scarboro soils that make up about 15 percent of this map unit.

The permeability of this soil is rapid, and available water capacity is low. Reaction is strongly acid to extremely acid. The rooting zone is restricted by a seasonal high water table which is at or near the surface in winter and spring.

Most areas of this soil are in woodland. A few areas are in residential and urban development.

This soil is poorly suited to cultivated crops but is suited to moisture-tolerant hay and pasture plants. The main management needs include drainage and appropriate timing of farming operations. Good tilth and the organic matter content are easy to maintain in this soil. The use of proper stocking rates, deferred grazing, and

pasture rotation help maintain desirable pasture plant species.

The soil is suitable for trees, openland wildlife habitat, and woodland wildlife habitat. The seasonal high water table limits use of the soil for recreational and residential development and as a site for waste disposal facilities. The rapid permeability of the soil is an additional limitation for waste disposal facilities.

This unit is in capability subclass IVw.

WeB—Wareham loamy sand, 3 to 8 percent slopes. This deep, gently sloping, poorly drained soil is in irregularly shaped areas that range from 5 to 15 acres. Slopes are 100 to 200 feet long.

Typically, the surface layer is very friable, very dark brown loamy sand about 8 inches thick. The subsurface layer is very friable, light gray loamy sand 2 inches thick. The subsoil is friable, yellowish brown, mottled loamy sand 7 inches thick. The substratum is mottled, loose, dark grayish brown and grayish brown sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Scarboro soils that make up about 15 percent of this map unit.

The permeability of this soil is rapid, and available water capacity is low. Reaction is strongly acid to extremely acid. The rooting zone is restricted by a seasonal high water table which is at or near the surface in winter and spring.

Most areas of this soil are in woodland. A few areas are in residential and urban development.

This soil is poorly suited to cultivated crops but is suited to moisture-tolerant hay and pasture plants. The main management needs include drainage and appropriate timing of farming operations. Good tilth and the organic matter content are easy to maintain in this soil. The use of proper stocking rates, deferred grazing, and pasture rotation help maintain desirable pasture plant species.

The soil is suitable for trees and openland wildlife habitat. The seasonal high water table limits use of the soil for recreational and residential development and as a site for waste disposal facilities.

This unit is in capability subclass IVw.

Wf—Whately Variant fine sandy loam. This deep, nearly level, very poorly drained soil is in low areas and depressions near large streams. The areas are elongated or irregular in shape and range from 5 to 50 acres in size. Slopes are 100 to 400 feet long.

Typically, the surface layer is friable, very dark gray fine sandy loam about 8 inches thick. The subsoil is loose, mottled, grayish brown loamy sand 15 inches thick. The substratum extends to a depth of 60 inches or more. It is mottled, firm, gray silty clay loam to a depth of 30 inches and silty clay at a depth of more than 30 inches.

Included with this soil in mapping are small areas of Swanton soils and Medisaprists, shallow. Also included are areas with a subsoil of fine sandy loam and a substratum of silt loam. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderately rapid in the subsoil and slow in the substratum. Available water capacity is high. Reaction is medium acid to slightly acid in the subsoil and slightly acid to neutral in the substratum. The rooting zone is restricted by a seasonal high water table which is at or near the surface during most of the year.

Most areas of this soil are in woodland, but the soil is poorly suited to tree production. Some areas are idle farmland.

The seasonal high water table makes this soil poorly suited to farming. Drainage of the soil is difficult because of the slow permeability in the substratum.

The soil is suitable for wetland wildlife habitat, but the seasonal high water table limits the soil for recreational and residential development and as a site for waste disposal facilities. A susceptibility to frost action is an additional limitation for residential development.

This unit is in capability subclass Vw.

Wg—Whitman loam. This deep, nearly level, very poorly drained soil is in depressions and low areas that range from 5 to 10 acres. Slopes are 100 to 400 feet long.

Typically, the surface layer is very friable, black loam about 9 inches thick. The substratum extends to a depth of 60 inches or more. It is firm, gray, mottled sandy loam to a depth of 20 inches and very firm, gray, mottled loamy sand at a depth of more than 20 inches.

Included with this soil in mapping are small areas of Ridgebury and Leicester soils and soils with slopes of 3 to 8 percent. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderately rapid in the surface layer and upper part of the substratum and slow in the lower part of the substratum. Available water capacity is low. Reaction is very strongly acid to medium acid. The rooting zone extends to the very firm part of the substratum, but root growth is restricted by a seasonal high water table which is at or near the surface during most of the year.

Most areas of this soil are in woodland, but the soil is poorly suited to tree production.

The soil is suitable for wetland wildlife habitat, but the seasonal high water table makes this soil poorly suited to farming and limits use of the soil for recreational and residential development and as a site for waste disposal facilities. The slow permeability in the lower part of the substratum is an additional limitation for waste disposal facilities.

This unit is in capability subclass Vw.

Wh—Whitman extremely stony loam. This deep, nearly level, very poorly drained soil is in depressions and low areas. Slopes are smooth or very gently undulating and are 100 to 400 feet long. The areas range from 5 to 50 acres and are covered by stones and boulders 1 to 3 feet in diameter that are 5 to 100 feet apart.

Typically, the surface layer is very friable, black loam about 9 inches thick. The substratum extends to a depth of 60 inches or more. It is firm, gray, distinctly mottled sandy loam to a depth of 20 inches and very firm, gray, distinctly mottled loamy sand at a depth of more than 20 inches.

Included with this soil in mapping are small areas of Ridgebury and Leicester soils and soils with slopes of 3 to 8 percent. Included soils make up about 15 percent of this map unit.

The permeability of this soil is moderately rapid in the surface layer and upper part of the substratum and slow in the lower part of the substratum. Available water capacity is low. Reaction is very strongly acid to medium acid. The rooting zone extends to the very firm part of the substratum, but root growth is restricted by a seasonal high water table which is at or near the surface in winter and spring.

Most areas of this soil are in woodland, but the soil is poorly suited to tree production.

The soil is suitable for wetland wildlife habitat, but the seasonal high water table and stones on the surface make the soil poorly suited to farming. The seasonal high water table and stones also limit the soil for recreational and residential development and as a site for waste disposal facilities. The slow permeability in the lower part of the substratum is an additional limitation for waste disposal facilities.

This unit is in capability subclass VIIs.

WnA—Windsor loamy sand, 0 to 3 percent slopes. This deep, nearly level, excessively drained soil is in irregularly shaped areas that range from 5 to 25 acres.

Typically, the surface layer is very friable, very dark grayish brown loamy sand about 10 inches thick. The subsoil is 18 inches thick. It is yellowish brown loamy sand in the upper part and yellowish brown and very pale brown sand in the lower part. The substratum is pale yellow sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Deerfield, Wareham, Pipestone, and Scarboro soils that make up about 15 percent of the map unit.

The permeability of this soil is rapid or very rapid, and available water capacity is low. Reaction is very strongly acid or strongly acid. The rooting zone extends into the substratum, but root growth is often restricted by lack of moisture.

Most areas of this soil are in residential and urban development. Some areas are in woodland, but the soil is poorly suited to tree production. Some areas are farmed.

This soil is suitable for cultivated crops, hay, and pasture. The low available water capacity makes irrigation a major management concern. Mixing crop residue and manure into the surface layer maintains tilth and increases the organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

The sandy texture of the surface layer limits the soil for most types of recreational development, and the soil is poorly suited to most types of wildlife habitat.

The soil is generally suitable for residential development. The rapid permeability, however, limits the soil as a site for sanitary landfills and causes a hazard of pollution to wells and streams where the soil is used as a site for septic tank absorption fields.

This unit is in capability subclass IIIe.

WnB—Windsor loamy sand, 3 to 8 percent slopes. This deep, gently sloping, excessively drained soil is in irregularly shaped areas that range from 20 to 100 acres.

Typically, the surface layer is very friable, very dark grayish brown loamy sand about 10 inches thick. The subsoil is 18 inches thick. It is yellowish brown loamy sand in the upper part and yellowish brown and very pale brown sand in the lower part. The substratum is pale yellow sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Deerfield, Wareham, and Pipestone soils. Also included are areas of Windsor soils with stones and rock outcrops on the surface. Included soils make up about 20 percent of this map unit.

The permeability of this soil is rapid or very rapid, and available water capacity is low. Reaction is very strongly acid or strongly acid. The rooting zone extends into the substratum, but root growth is often restricted by a lack of moisture.

Many areas of this soil are in residential and urban development. Some areas are in woodland, but the soil is poorly suited to tree production.

The soil is suitable for cultivated crops, hay, and pasture. The low available water capacity makes irrigation a major management concern. Where this soil is farmed, minimum tillage, the use of cover crops and grasses and legumes in the cropping system, and mixing crop residue and manure into the surface layer help maintain tilth and increase the organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

The sandy texture of the surface layer limits the soil for most types of recreational development, and the soil is poorly suited to most types of wildlife habitat.

The soil is generally suitable for residential development. The rapid permeability, however, limits the soil as a site for sanitary landfills and causes a hazard of pollution to wells and streams where the soil is used as a site for septic tank filter fields.

This unit is in capability subclass IIIs.

WnC—Windsor loamy sand, 8 to 15 percent slopes. This deep, moderately sloping, excessively drained soil is in irregularly shaped areas that range from 20 to 75 acres. Slopes are 100 to 300 feet long.

Typically, the surface layer is very friable, very dark grayish brown loamy sand 5 inches thick. The subsoil is 23 inches thick. It is yellowish brown loamy sand in the upper part and yellowish brown and very pale brown sand in the lower part. The substratum is pale yellow sand to a depth of 60 inches or more.

Included with this soil in mapping are areas of Deerfield, Pipestone, Wareham, and Scarboro soils and Medisaprists, shallow. Also included are areas of Windsor soils with stones and rock outcrops on the surface and areas of soils that partly consist of coarse sand. Included soils make up about 20 percent of this map unit.

The permeability of this soil is rapid or very rapid, and available water capacity is low. Reaction is very strongly acid or strongly acid. The rooting zone extends into the substratum, but root growth is often restricted by a lack of moisture.

Many areas of this soil are in residential development. Some areas are in woodland, but the soil is poorly suited to tree production. A few areas are farmed.

This soil is poorly suited to cultivated crops, hay, or pasture. The low available water capacity makes irrigation a major concern. The erosion hazard is moderate. Where this soil is farmed, stripcropping, minimum tillage, and the use of cover crops and grasses and legumes in the cropping system help reduce runoff and control erosion. Mixing crop residue and manure into the surface layer maintains tilth and increases the organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

Slope limits use of the soil for recreational and residential development and as a site for waste disposal facilities. The sandy surface layer is an additional limitation for recreation, and the rapid permeability for waste disposal facilities. The soil is poorly suited to most types of wildlife habitat.

This unit is in capability subclass IVs.

WnD—Windsor loamy sand, 15 to 25 percent slopes. This deep, moderately steep and hilly, excessively drained soil is in areas that range from 5 to 60 acres. Slopes are 100 to 200 feet long.

Typically, the surface layer is very friable, very dark grayish brown loamy sand 3 inches thick. The subsoil is 25 inches thick. It is yellowish brown loamy sand in the upper part and yellowish brown and very pale brown sand in the lower part. The substratum is pale yellow sand to a depth of 60 inches or more.

Included with this soil in mapping are areas of Windsor soils with stones and rock outcrops on the surface and areas of soils that partly consist of coarse sand. Included soils make up about 15 percent of this map unit.

The permeability of this soil is rapid or very rapid, and available water capacity is low. Reaction is very strongly acid or strongly acid. The rooting zone extends into the substratum, but root growth is often restricted by a lack of moisture.

Most areas of this soil are in woodland. A few areas are in residential development.

The low available water capacity and a severe erosion hazard make this soil poorly suited to farming. The soil also is poorly suited to tree production and most types of wildlife habitat.

Slope limits the soil for recreational and residential development and as a site for waste disposal facilities. The sandy surface layer is an additional limitation for recreational use, and the rapid permeablity for waste disposal facilities.

This unit is in capability subclass VIs.

WoC—Windsor-Rock outcrop complex, 3 to 15 percent slopes. This complex consists of areas of excessively drained, deep Windsor soils and exposed rock in valleys and on outwash plains. Slopes are 50 to 400 feet long. The areas of exposed rock are less than 50 feet apart, and some areas of the complex have stones on the surface. The complex consists of about 60 percent Windsor soils, 25 percent Rock outcrop, and 15 percent other soils. The soils and exposed rock are so intermingled that it was not practical to map them separately.

Typically, the Windsor soils have a surface layer of very friable, very dark grayish brown loamy sand 3 inches thick. The subsoil is 25 inches thick. It is yellowish brown loamy sand in the upper part and yellowish brown and very pale brown sand in the lower part. The substratum is pale yellow sand to a depth of 60 inches or more.

Included with this complex in mapping are small areas of Wareham, Pipestone, and Scarboro soils.

Permeability is rapid or very rapid in the Windsor soils, and available water capacity is low. Reaction is very strongly acid or strongly acid. The rooting zone extends into the substratum, but root growth is often restricted by a lack of moisture.

Most areas of this unit are in woodland. A few areas are in residential development.

The low available water capacity and the areas of exposed rock make this complex poorly suited to farming. The complex also is poorly suited to tree production and most types of wildlife habitat.

The areas of exposed rock are the main limitation of the complex for recreational and residential development and as a site for waste disposal facilities. The sandy surface layer is an additional limitation for recreational uses, and the rapid permeability for waste disposal facilities.

This unit is in capability subclass VIIs.

WoD—Windsor-Rock outcrop complex, 15 to 25 percent slopes. This complex consists of areas of excessively drained, deep Windsor soils and areas of exposed rock in valleys and on outwash plains. Slopes are 50 to 400 feet long. The areas of exposed rock are less than 50 feet apart, and some areas of the complex have stones on the surface. The complex consists of about 55 percent Windsor soils, 30 percent Rock outcrop, and 15 percent other soils. The soils and exposed rock are so intermingled that it was not practical to map them separately.

Typically, the Windsor soils have a surface layer of very friable, very dark grayish brown loamy sand 3 inches thick. The subsoil is 25 inches thick. It is yellowish brown loamy sand in the upper part and yellowish brown and very pale brown sand in the lower part. The substratum is pale yellow sand to a depth of 60 inches or more.

Included with this complex in mapping are small areas of Wareham and Scarboro soils.

Permeability is rapid or very rapid in the Windsor soils, and available water capacity is low. Reaction is very strongly acid or strongly acid. The rooting zone extends into the substratum, but root growth is often restricted by lack of moisture.

Most areas of this unit are in woodland. A few areas are in residential development.

The low available water capacity and the areas of exposed rock make this complex poorly suited to farming. The complex also is poorly suited to tree production and most types of wildlife habitat.

Slope and the areas of exposed rock limit use of the complex for recreational and residential development and as a site for waste disposal facilities. The sandy surface layer is an additional limitation for recreational use, and the rapid permeability for waste disposal facilities.

This unit is in capability subclass VIIs.

Wp—Winooski very fine sandy loam. This deep, nearly level, moderately well drained soil is on flood plains. These areas are semicircular or irregular in shape and range from 5 to 35 acres. This soil is near stream level and is subject to flooding, at a frequency that ranges from once in 2 years to once in 15 years.

Typically, the surface layer is very dark grayish brown very fine sandy loam about 8 inches thick. The substratum extends to a depth of 60 inches or more. It is light olive brown, friable fine sandy loam to a depth of 24 inches; light olive brown, mottled, friable very fine sandy loam to a depth of 38 inches; and light olive brown, mottled, friable, thin layers of silt and very fine sand at a depth of more than 38 inches.

Included with this soil in mapping are small areas of Limerick and Rumney soils and Saco Variant soils. Also included are areas of soils with mottles at a depth of 15 to 20 inches, soils with slopes of 3 to 8 percent, and soils with a subsoil of fine sandy loam. Included soils make up about 30 percent of this map unit.

The permeability of this soil is moderate or moderately rapid, and available water capacity is high. Reaction ranges from very strongly acid to neutral in the upper part of the soil and from medium acid to neutral in the lower part. The rooting zone extends into the substratum, but root growth is restricted by a seasonal high water table which is within 2 feet of the surface in winter and spring.

Many areas of this soil are in residential and urban development. Other areas are farmed or used for wildlife habitat.

This soil is well suited to cultivated crops, hay, and pasture. Flooding and soil blowing are the main hazards, and the seasonal high water table is the main limitation for farming. Good tilth is easily maintained in cultivated areas. The main management needs include proper timing of farming operations, protection from flooding, and providing drainage. Where this soil is farmed, minimum tillage and the use of cover crops and grasses and legumes in the cropping system help reduce soil blowing and control flood scouring. Mixing crop residue and manure into the surface layer improves tilth and increases the organic matter content. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

The soil is suitable for trees, openland wildlife habitat, and woodland wildlife habitat, but the flooding hazard limits most types of recreational use other than trails.

The flooding hazard and a susceptibility to frost action are the main limitations of the soil for residential development. Flooding, along with the moderate or moderately rapid permeability in the substratum, also limits use of the soil as a site for waste disposal facilities.

This unit is in capability subclass IIw.

WrA—Woodbridge fine sandy loam, 0 to 3 percent slopes. This deep, nearly level, moderately well drained soil is in oval areas on the tops of hills and in broad flats at lower elevations. The areas range from 5 to 15 acres.

Typically, the surface layer is friable, very dark grayish brown fine sandy loam about 9 inches thick. The subsoil is friable fine sandy loam 17 inches thick. It is yellowish brown in the upper part, mottled olive brown in the middle part, and mottled olive in the lower part. The substratum is mottled, very firm, light olive brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Ridgebury and Whitman soils that make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the subsoil and slow in the substratum. Available water capacity is moderate. The rooting zone extends to a depth of about 26 inches, where root growth is restricted by the very firm substratum. Reaction is medium acid

to strongly acid. A seasonal high water table is at a depth of 1.5 to 3 feet during winter and spring.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some areas still are farmed, and many are in urban and residential development.

This soil is well suited to cultivated crops, hay, and pasture. The seasonal high water table is the main limitation, and providing drainage is a management concern. Mixing crop residue and animal manure into the surface layer improves tilth and increases the organic matter content of the soil. The use of proper stocking rates, deferred grazing, pasture rotation, and restricted grazing when the soil is saturated help to maintain desirable pasture plant species.

The soil is suitable for trees and openland wildlife habitat, but the slow permeability in the substratum is a limitation for some types of recreational development.

The seasonal high water table limits use of the soil for residential development and as a site for waste disposal facilities. A susceptibility to frost action is an additional limitation for residential development, and the slow permeability in the substratum for waste disposal facilities.

This unit is in capability subclass IIw.

WrB—Woodbridge fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, moderately well drained soil is in rectangular or oval areas on or near the tops of drumloidal hills and is in irregularly shaped areas at lower elevations. The areas range from 5 to 25 acres. Slopes are 100 to 400 feet long.

Typically, the surface layer is friable, very dark grayish brown fine sandy loam about 9 inches thick. The subsoil is friable fine sandy loam 17 inches thick. It is yellowish brown in the upper part, mottled olive brown in the middle part, and mottled olive in the lower part. The substratum is mottled, very firm, light olive brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Ridgebury and Whitman soils. Also included are areas of soils with a subsoil of loamy sand. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the subsoil and slow in the substratum. Available water capacity is moderate. The rooting zone of plants extends to a depth of about 26 inches, where root growth is restricted by the very firm substratum. Reaction ranges from medium acid to strongly acid. A seasonal high water table is at a depth of 1.5 to 3 feet during winter and spring.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some areas still are farmed, and some are in urban and residential development.

This soil is well suited to cultivated crops, hay, and pasture. The seasonal high water table is the main limitation, and providing drainage is a management concern. Mixing crop residue and manure into the surface layer improves tilth and increases the organic matter content of the soil. Erosion is a moderate hazard in cultivated areas. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

The soil is suitable for trees and openland wildlife habitat, but the slow permeability in the substratum is a limitation for some types of recreational development.

The seasonal high water table limits use of the soil for residential development and as a site for waste disposal facilities. A susceptibility to frost action is an additional limitation for residential development, and the slow permeability in the substratum for waste disposal facilities.

This unit is in capability subclass IIw.

WrC—Woodbridge fine sandy loam, 8 to 15 percent slopes. This deep, sloping, moderately well drained soil is in rectangular or oval areas on or near the tops of drumloidal hills and is in irregularly shaped areas at lower elevations. The areas range from 5 to 25 acres. Slopes are 100 to 400 feet long.

Typically, the surface layer is friable, very dark grayish brown fine sandy loam about 8 inches thick. The subsoil is friable fine sandy loam 17 inches thick. It is yellowish brown in the upper part, mottled olive brown in the middle part, and mottled olive in the lower part. The substratum is mottled, very firm, light olive brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Ridgebury and Paxton soils. Also included are areas of soils with slopes of 15 to 25 percent and areas of soils with a subsoil of loamy sand.

The permeabiliy of this soil is moderate or moderately rapid in the subsoil and slow in the substratum. Available water capacity is moderate. The rooting zone extends to a depth of about 25 inches, where root growth is restricted by the very firm substratum. Reaction ranges from medium acid to strongly acid. A seasonal high water table is at a depth of 1.5 to 3 feet during winter and spring.

Most areas of this soil have been farmed. Some previously cleared areas have reverted to or been planted to trees. Some areas still are farmed, and some are in residential development.

This soil is suited to cultivated crops, hay, and pasture. The erosion hazard is moderately severe. The seasonal high water table is a limitation, and providing drainage is a major concern. Mixing crop residue and manure into the surface layer improves tilth and increases the organic matter content of the soil. Minimum tillage, contour cultivation, and incorporating grasses and legumes in the cropping system help reduce runoff and control erosion. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

The soil is suitable for trees and openland wildlife habitat, but slope and the slow permeability in the substratum limit some types of recreational development.

The seasonal high water table limits use of the soil for residential development and as a site for waste disposal facilities. A susceptibility to frost action is an additional limitation for residential development, and slope and the slow permeability in the substratum also limit use for waste disposal facilities.

This unit is in capability subclass IIIe.

WsB—Woodbridge very stony fine sandy loam, 0 to 8 percent slopes. This deep, nearly level and gently sloping, moderately well drained soil is in irregularly shaped areas on hills and is on broad flats at lower elevations. The areas range from 5 to 50 acres and are covered by stones 1 to 3 feet in diameter that are 30 to 100 feet apart. Slopes are 100 to 500 feet long.

Typically, the surface layer is friable, very dark grayish brown fine sandy loam about 6 inches thick. The subsoil is friable fine sandy loam 19 inches thick. It is yellowish brown in the upper part, mottled olive brown in the middle part, and mottled olive in the lower part. The substratum is mottled, very firm, light olive brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Ridgebury and Whitman soils and soils with a subsoil of loamy sand. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the subsoil and slow in the substratum. Available water capacity is moderate. The rooting zone extends to a depth of about 25 inches, where root growth is restricted by the very firm substratum. Reaction ranges from medium acid to strongly acid. A seasonal high water table is at a depth of 1.5 to 3 feet during winter and spring.

Most areas of this soil are in woodland. Some areas are in residential and urban development.

The stones on the surface make this soil poorly suited to cultivated crops. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

The soil is suitable for trees and woodland wildlife habitat, but the slow permeability in the substratum and the stones on the surface limit most types of recreational development other than picnic areas.

A susceptibility to frost action, the seasonal high water table, and the slow premeability in the substratum limit the soil for residential development and as a site for waste disposal facilities.

This unit is in capability subclass VIs.

WsC—Woodbridge very stony fine sandy loam, 8 to 15 percent slopes. This deep, moderately sloping, moderately well drained soil is in irregularly shaped areas on hills and ridges. The areas range from 5 to 50 acres and are covered by stones 1 to 3 feet in diameter that are 30 to 100 feet apart. Slopes are 100 to 500 feet long.

Typically, the surface layer is friable, very dark grayish brown fine sandy loam about 6 inches thick. The subsoil is friable fine sandy loam 19 inches thick. It is yellowish brown in the upper part, mottled olive brown in the middle part, and mottled olive in the lower part. The substratum is mottled, very firm, light olive brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Ridgebury and Paxton soils that make up about 15 percent of the map unit.

The permeability of this soil is moderate or moderately rapid in the subsoil and slow in the substratum. Available water capacity is moderate. The rooting zone extends to a depth of about 25 inches, where root growth is restricted by the very firm substratum. Reaction ranges from medium acid to strongly acid. A seasonal high water table is at a depth of 1.5 to 3 feet during winter and spring.

Most areas of this soil are in woodland. Some areas are in residential development.

The stones on the surface make this soil poorly suited to cultivated crops. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

The soil is suitable for trees and woodland wildlife habitat, but slope, the stones on the surface, and the slow permeability in the substratum limit most types of recreational development.

A susceptibility to frost action, slope, the seasonal high water table, and the stones on the surface limit the soil for residential development and as a site for waste disposal facilities.

This unit is in capability subclass VIs.

WsD—Woodbridge very stony fine sandy loam, 15 to 25 percent slopes. This deep, moderately steep, moderately well drained soil is in irregularly shaped areas on the lower slopes of drumloidal hills. The areas range from 5 to 50 acres and are covered by stones 1 to 3 feet in diameter that are 30 to 100 feet apart. Slopes are 100 to 500 feet long.

Typically, the surface layer is friable, very dark grayish brown fine sandy loam about 6 inches thick. The subsoil is friable fine sandy loam 19 inches thick. It is yellowish brown in the upper part, mottled olive brown in the middle part, and mottled olive in the lower part. The substratum is mottled, very firm, light olive brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Ridgebury and Paxton soils that make up about 15 percent of the map unit.

The permeability of this soil is moderate or moderately rapid in the subsoil and slow in the substratum. Available water capacity is moderate. The rooting zone extends to

a depth of about 25 inches, where root growth is restricted by the very firm substratum. Reaction ranges from medium acid to strongly acid. A seasonal high water table is at a depth of 1.5 to 3 feet during winter and spring.

Most areas of this soil are in woodland, and the soil is suitable for trees and woodland wildlife habitat.

The stones on the surface and slope make the soil poorly suited to cultivated crops and are the main limitations for recreational development. The use of proper stocking rates, deferred grazing, and pasture rotation help to maintain desirable pasture plant species.

The seasonal high water table and slope limit the soil for residential development and as a site for waste disposal facilities.

This unit is in capability subclass VIs.

WtB—Woodbridge extremely stony fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, moderately well drained soil is in oval and irregularly shaped areas on the tops of drumlins and drumloidal hills, and is on broad flats at lower elevations. The areas range from 5 to 50 acres and are covered by stones 1 to 3 feet in diameter that are 10 to 30 feet apart. Slopes are 100 to 600 feet long.

Typically, the surface layer is friable, very dark grayish brown fine sandy loam about 4 inches thick. The subsoil is friable fine sandy loam 21 inches thick. It is yellowish brown in the upper part, mottled olive brown in the middle part, and mottled olive in the lower part. The substratum is mottled, very firm, light olive brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Ridgebury and Whitman soils. Also included are areas of soils with slopes of 0 to 3 percent. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the subsoil and slow in the substratum. Available water capacity is moderate, and reaction ranges from medium acid to strongly acid. The rooting zone extends to a depth of about 25 inches, where root growth is restricted by the very firm substratum. A seasonal high water table is at a depth of 1.5 to 3 feet during winter and spring.

Many areas of this soil are in residential and urban development. Some areas are in woodland, and the soil is suitable for trees and woodland wildlife habitat.

The stones on the surface make the soil poorly suited to farming and limit most types of recreational development.

A susceptibility to frost action, the seasonal high water table, and the slow permeability in the substratum are the main limitations of the soil for residential development and as a site for waste disposal facilities.

This unit is in capability subclass VIIs.

WtC—Woodbridge extremely stony fine sandy loam, 8 to 15 percent slopes. This deep, moderately sloping, moderately well drained soil is in oval and irregularly shaped areas on the tops of drumlins and drumloidal hills and on the lower slopes of these hills. The areas range from 5 to 50 acres and are covered by stones 1 to 3 feet in diameter that are 10 to 30 feet apart. Slopes are 100 to 600 feet long.

Typically, the surface layer is friable, very dark grayish brown fine sandy loam about 3 inches thick. The subsoil is friable fine sandy loam 21 inches thick. It is yellowish brown in the upper part, mottled olive brown in the middle part, and mottled olive in the lower part. The substratum is mottled, very firm, light olive brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Ridgebury and Paxton soils. Also included are areas of soils with slopes of 15 to 25 percent. Included soils make up about 20 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the subsoil and slow in the substratum. Available water capacity is moderate, and reaction ranges from medium acid to strongly acid. The rooting zone extends to a depth of about 24 inches, where root growth is restricted by the very firm substratum. A seasonal high water table is at a depth of 1.5 to 3 feet during winter and spring.

Most areas of this soil are in woodland, and the soil is suitable for trees and woodland wildlife habitat. Some areas are in residential development.

The stones on the surface make the soil poorly suited to farming and, along with slope, are the main limitations for recreational development.

A susceptibility to frost action, the seasonal high water table, slope, and the stones on the surface limit the soil for residential development and as a site for waste disposal facilities.

This unit is in capability subclass VIIs.

Use and management of the soils

The soil survey is a detailed inventory and evaluation of the most basic resource of the survey area—the soil. It is useful in adjusting land use, including urbanization, to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in uses of the land.

While a soil survey is in progress, soil scientists, conservationists, engineers, and others keep extensive notes about the nature of the soils and about unique aspects of behavior of the soils. These notes include data on erosion, drought damage to specific crops, yield estimates, flooding, the functioning of septic tank disposal systems, and other factors affecting the productivity, potential, and limitations of the soils under various uses and management. In this way, field experience and

measured data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section is useful in planning use and management of soils for crops and pasture, for woodland, as sites for buildings, highways and other transportation systems, sanitary facilities, and parks and other recreation facilities, and for wildlife habitat. From the data presented, the potential of each soil for specified land uses can be determined, soil limitations to these land uses can be identified, and costly failures in houses and other structures, caused by unfavorable soil properties, can be avoided. A site where soil properties are favorable can be selected, or practices that will overcome the soil limitations can be planned.

Planners and others using the soil survey can evaluate the impact of specific land uses on the overall productivity of the survey area or other broad planning area and on the environment. Productivity and the environment are closely related to the nature of the soil. Plans should maintain or create a land-use pattern in harmony with the natural soil.

Contractors can find information that is useful in locating sources of sand and gravel, roadfill, and topsoil. Other information indicates the presence of bedrock, wetness, or very firm soil horizons that cause difficulty in excavation.

Health officials, highway officials, engineers, and many other specialists also can find useful information in this soil survey. The safe disposal of wastes, for example, is closely related to properties of the soil. Pavements, sidewalks, campsites, playgrounds, lawns, and trees and shrubs are influenced by the nature of the soil.

Crops and pasture

The major management concerns in the use of the soils for crops and pasture are described in this section. In addition, the crops or pasture plants best suited to the soil, including some not commonly grown in the survey area, are discussed; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are presented for each soil.

This section provides information about the overall agricultural potential of the survey area and about the management practices that are needed. The information is useful to equipment dealers, land improvement contractors, fertilizer companies, processing companies, planners, conservationists, an others. For each kind of soil, information about management is presented in the section "Soil maps for detailed planning." Planners of management systems for individual fields or farms should also consider the detailed information given in the description of each soil.

Field crops suited to the soils and climate of the survey area—including some not commonly grown in the area—are potatoes, corn, grain sorghum, oats, wheat, barley, and buckweat.

Speciality crops grown in the survey area include vegetables, small fruits, tree fruits, and nursery plants. Sweet corn, tomatoes, squash, pumpkins, and snap beans are the most common vegetables grown commercially. Many other commerical crops, such as strawberries, raspberries, and blueberries, are suited to the soils and are grown to some extent throughout the survey area. Apples are the main tree fruit. Pears are suited to the area, and peaches are suitable only where climatic conditions are most favorable.

Cropland and pasture make up about 18,000 acres of the survey area (*4*). An estimated 80 percent of this acreage is used for hay and pasture; 8 percent for row crops, mainly corn; and 12 percent for orchards, vegetables, and nursery plants. The acreage in crops and pasture has been gradually decreasing, mainly as a result of urban pressure from the greater Boston area and from cities within the survey area. In 1951 the survey area had about 20,600 acres of urban and built-up land, and this amount has been growing at the rate of about 1,000 acres per year.

Erosion causes the loss of the surface layer and incorporation of part of the subsoil into the plow layer, both of which result in reduced productivity of crops and pasture. Loss of the surface layer is especially damaging to soils with a clayey subsoil, such as the Buxton, Elmwood, and Melrose soils. It is also damaging to soils with a hard layer or bedrock in or below the subsoil that limits the depth of the root zone, for example, in the Paxton, Montauk, Woodbridge, and Hollis soils. Erosion also results in the pollution of streams by sediment and in lower water quality for municipal use and recreation and as habitat for fish and wildlife.

A cropping system that keeps plant cover on the soil for extended periods can hold soil erosion losses to amounts that will not reduce the productive capacity of the soils. On livestock farms, which require pasture and hay, the legume and grass forage crops in the cropping system reduce erosion on sloping land and provide nitrogen and improved tilth for the following crop.

Terraces and diversions are effective in reducing the length of the slope, thus reducing runoff and erosion. Many parts of the survey area, however, have short and irregular slopes that are not suited to terraces. Diversions are also effective in intercepting water, thereby protecting downslope fields.

Stripcropping is effective when installed on the contour and is best suited to soils that have long, uniform slopes.

Minimum tillage or no-till farming for crops that are usually planted after plowing and harrowing helps protect the soil from erosion. Cover crops of grain or grass help protect soils from erosion during periods when row crops are not grown.

A *seasonal high water table* makes some soils so wet that the production of crops common to the area gener-

ally is not feasible. Such soils are also poorly suited to pasture (fig. 12).

The very poorly drained soils, such as Scarboro and Whitman soils, are generally too wet for crop production unless they are drained, but a lack of adequate outlets in most areas makes drainage difficult.

The poorly drained soils are too wet for good crop production during most years unless they are drained. These include the Scantic, Pipestone, and Walpole soils.

The moderately well drained soils, such as Woodbridge and Sutton soils, generally cannot be tilled or worked until late spring or early summer. They are poorly suited to early-season crops.

The design and use of surface and subsurface drainage systems varies with the kind of soil; in some areas a combination of surface drainage and tile drainage is needed if the soils are to be used intensively.

The *natural fertility* and *reaction* in the soils of the survey area generally make additions of lime and fertilizer necessary. The soils are naturally strongly acid or very strongly acid, and the available phosphorus and potassium levels are low.

Tilth affects the germination of seeds and the infiltration of water into the soil. Soils with good tilth are granular, friable, and porous. Many of the soils in the survey area require regular additions of crop residue, manure, and other organic material to increase the organic matter content, to maintain structure, and to improve tilth.

The latest information on growing specialty crops and field crops, on controlling erosion and maintaining tilth, and on the use of lime and fertilizers can be obtained from the local offices of the Cooperative Extension Service and the Soil Conservation Service.

Yields per acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. Ab-

Figure 12.—The area of Canton soils in the background is used for grazing, but the Medisaprists in the foreground are unsuitable for crops or pasture.

sence of an estimated yield indicates that the crop is not suited to or not commonly grown on the soil or that a given crop is not commonly irrigated.

The estimated yields were based mainly on the experience and records of farmers, conservationists, and extension agents. Results of field trials and demonstrations and available yield data from nearby counties were also considered.

The yields were estimated assuming that the latest soil and crop management practices were used. Hay and pasture yields were estimated for the most productive varieties of grasses and legumes suited to the climate and the soil. A few farmers may be obtaining average yields higher than those shown in table 5.

The management needed to achieve the indicated yields of the various crops depends on the kind of soil and the crop. Such management provides drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate tillage practices, including time of tillage and seedbed preparation and tilling when soil moisture is favorable; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residues, barnyard manure, and green-manure crops; harvesting crops with the smallest possible loss; and timeliness of all fieldwork.

The estimated yields reflect the productive capacity of the soils for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not included because the acreage of these crops is small. The local offices of the Soil Conservation Service and the Cooperative Extension Service can provide information about the management concerns and productivity of the soils for these crops.

Capability classes and subclasses

Capability classes and subclasses show, in a general way, the suitability of soils for most kinds of field crops. The soils are classed according to their limitations when they are used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops that require special management. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for forest trees or for engineering purposes.

In the capability system, all kinds of soil are grouped at two levels: capability class and subclass. These levels are defined in the following paragraphs. A survey area may not have soils of all classes.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants, or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants, or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and landforms have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class; they are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

The acreage of soils in each capability class and subclass is indicated in table 6. All soils in the survey area except those named at a level higher than the series are included. Some of the soils that are well suited to crops and pasture may be in low-intensity use, for example, soils in capability classes I and II. Data in this table can be used to determine the farming potential of such soils.

The capability subclass is identified in the description of each soil mapping unit in the section "Soil maps for detailed planning."

Woodland management and productivity

Table 7 contains information useful to woodland owners or forest managers planning use of soils for wood crops. Mapping unit symbols for soils suitable for wood crops are listed, and the ordination (woodland suitability) symbol for each soil is given. All soils bearing the same ordination symbol require the same general kinds of woodland management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *x* indicates stoniness or rockiness; *w*, excessive water in or on the soil; *t*, toxic substances in the soil; *d*, restricted root depth; *c*, clay in the upper part of the soil; *s*, sandy texture; *f*, high content of coarse fragments in the soil profile; and *r*, steep slopes. The letter *o* indicates insignificant limitations or restrictions. If a soil has more than one limitation, priority in placing the soil into a limitation class is in the following order: x, w, t, d, c, s, f, and r.

In table 7 the soils are also rated for a number of factors to be considered in management. *Slight, moderate,* and *severe* are used to indicate the degree of major soil limitations.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if some measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or equipment; *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree that the soil affects expected mortality of planted tree seedlings. Plant competition is not considered in the ratings. Seedlings from good planting stock that are properly planted during a period of sufficient rainfall are rated. A rating of *slight* indicates that the expected mortality of the planted seedlings is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

Considered in the ratings of *windthrow hazard* are characteristics of the soil that affect the development of tree roots and the ability of the soil to hold trees firmly. A rating of *slight* indicates that trees in wooded areas are not expected to be blown down by commonly occurring winds; *moderate*, that some trees are blown down during periods of excessive soil wetness and strong winds; and *severe*, that many trees are blown down during periods of excessive soil wetness and moderate or strong winds.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands (fig. 13).

Trees to plant are those that are suitable for commercial wood production and that are suited to the soils.

Engineering

This section provides information about the use of soils for building sites, sanitary facilities, construction material, and water management. Among those who can benefit from this information are engineers, landowners,

Figure 13.—A stand of mature eastern white pine on Canton very stony fine sandy loam.

community planners, town and city managers, land developers, builders, contractors, and farmers.

The ratings in the engineering tables are based on test data and estimated data in the "Soil properties" section. The ratings were determined jointly by soil scientists and engineers of the Soil Conservation Service using known relationships between the soil properties and the behavior of soils in various engineering uses.

Among the soil properties and site conditions identified by a soil survey and used in determining the ratings in this section were grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock that is within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure or aggregation, in-place soil density, and geologic origin of the soil material. Where pertinent, data about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of absorbed cations were also considered.

On the basis of information assembled about soil properties, ranges of values can be estimated for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, shear strength, compressibility, slope stability, and other factors of expected soil behavior in engineering uses. As appropriate, these values can be applied to each major horizon of each soil or to the entire profile.

These factors of soil behavior affect construction and maintenance of roads, airport runways, pipelines, foundations for small buildings, ponds and small dams, irrigation projects, drainage systems, sewage and refuse disposal systems, and other engineering works. The ranges of values can be used to (1) select potential residential, commercial, industrial, and recreational uses; (2) make preliminary estimates pertinent to construction in a particular area; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for location of sanitary landfills, onsite sewage disposal systems, and other waste disposal facilities; (5) plan detailed onsite investigations of soils and geology; (6) find sources of gravel, sand, clay, and topsoil; (7) plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; (8) relate performance of structures already built to the properties of the kinds of soil on which they are built so that performance of similar structures on the same or a similar soil in other locations can be predicted; and (9) predict the trafficability of soils for cross-country movement of vehicles and construction equipment.

Data presented in this section are useful for land-use planning and for choosing alternative practices or general designs that will overcome unfavorable soil properties and minimize soil-related failures. Limitations to the use of these data, however, should be well understood. First, the data are generally not presented for soil material below a depth of 5 or 6 feet. Also, because of the scale of the detailed map in this soil survey, small areas of soils that differ from the dominant soil may be included in mapping. Thus, these data do not eliminate the need for onsite investigations, testing, and analysis by personnel having expertise in the specific use contemplated.

The information is presented mainly in tables. Table 8 shows, for each kind of soil, the degree and kind of limitations for building site development; table 9, for sanitary facilities; and table 11, for water management. Table 10 shows the suitability of each kind of soil as a source of construction materials.

The information in the tables, along with the soil map, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations and to construct interpretive maps for specific uses of land.

Some of the terms used in this soil survey have a special meaning in soil science. Many of these terms are defined in the Glossary.

Building site development

The degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping are indicated in table 8. A *slight* limitation indicates that soil properties generally are favorable for the specified use; any limitation is minor and easily overcome. A *moderate* limitation indicates that soil properties and site features are unfavorable for the specified use, but the limitations can be overcome or minimized by special planning and design. A *severe* limitation indicates that one or more soil properties or site features are so unfavorable or difficult to overcome that a major increase in construction effort, special design, or intensive maintenance is required. For some soils rated severe, such costly measures may not be feasible.

Shallow excavations are made for pipelines, sewerlines, communications and power transmission lines, basements, open ditches, and cemeteries. Such digging or trenching is influenced by soil wetness caused by a seasonal high water table; the texture and consistence of soils; the tendency of soils to cave in or slough; and the presence of very firm, dense soil layers, bedrock, or large stones. In addition, excavations are affected by slope of the soil and the probability of flooding. Ratings do not apply to soil horizons below a depth of 6 feet unless otherwise noted.

In the soil series descriptions, the consistence of each soil horizon is given, and the presence of very firm or extremely firm horizons, usually difficult to excavate, is indicated.

Dwellings and *small commercial buildings* referred to in table 8 are built on undisturbed soil and have foundation loads of a dwelling no more than three stories high. Separate ratings are made for small commercial buildings without basements and for dwellings with and with-

out basements. For such structures, soils should be sufficiently stable that cracking or subsidence of the structure from settling or shear failure of the foundation does not occur. These ratings were determined from estimates of the shear strength, compressibility, and shrink-swell potential of the soil. Soil texture, plasticity and in-place density, potential frost action, soil wetness, and depth to a seasonal high water table were also considered. Soil wetness and depth to a seasonal high water table indicate potential difficulty in providing adequate drainage for basements, lawns, and gardens. Depth to bedrock, slope, and large stones in or on the soil are also important considerations in the choice of sites for these structures and were considered in determining the ratings. Susceptibility to flooding is a serious hazard.

Local roads and streets referred to in table 8 have an all-weather surface that can carry light to medium traffic all year. They consist of a subgrade of the underlying soil material; a base of gravel, crushed rock fragments, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. The roads are graded with soil material at hand, and most cuts and fills are less than 6 feet deep.

The load supporting capacity and the stability of the soil as well as the quantity and workability of fill material available are important in design and construction of roads and streets. The classifications of the soil and the soil texture, density, shrink-swell potential, and potential frost action are indicators of the traffic supporting capacity used in making the ratings. Soil wetness, flooding, slope, depth to hard rock or very compact layers, and content of large stones affect stability and ease of excavation.

Lawns and landscaping require soils that are suitable for the establishment and maintenance of turf for lawns and ornamental trees and shrubs for landscaping. The best soils are firm after rains, are not dusty when dry, and absorb water readily and hold sufficient moisture for plant growth. The surface layer should be free of stones. If shaping is required, the soils should be thick enough over bedrock or hardpan to allow for necessary grading. In rating the soils, the availability of water for sprinkling is assumed.

Sanitary facilities

Favorable soil properties and site features are needed for proper functioning of septic tank absorption fields, sewage lagoons, and sanitary landfills. The nature of the soil is important in selecting sites for these facilities and in identifying limiting soil properties and site features to be considered in design and installation. Also, those soil properties that affect ease of excavation or installation of these facilities will be of interest to contractors and local officials. Table 9 shows the degree and kind of limitations of each soil for such uses and for use of the soil as daily cover for landfills. It is important to observe local ordinances and regulations.

If the degree of soil limitation is expressed as *slight*, soils are generally favorable for the specified use and limitations are minor and easily overcome; if *moderate*, soil properties or site features are unfavorable for the specified use, but limitations can be overcome by special planning and design; and if *severe*, soil properties or site features are so unfavorable or difficult to overcome that major soil reclamation, special designs, or intensive maintenance is required. Soil suitability is rated by the terms *good*, *fair*, or *poor*, which, respectively, mean about the same as the terms *slight*, *moderate*, and *severe*.

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into the natural soil. Only the soil horizons between depths of 18 and 72 inches are evaluated for this use. The soil properties and site features considered are those that affect the absorption of the effluent and those that affect the construction of the system.

Properties and features that affect absorption of the effluent are permeability, depth to seasonal high water table, depth to bedrock, and susceptibility to flooding. Stones, boulders, and shallowness to bedrock interfere with installation. Excessive slope can cause lateral seepage and surfacing of the effluent. Also, soil erosion and soil slippage are hazards if absorption fields are installed on sloping soils.

In some soils, loose sand and gravel or fractured bedrock is less than 4 feet below the tile lines. In these soils the absorption field does not adequately filter the effluent, and ground water in the area may be contaminated.

On many of the soils that have moderate or severe limitations for use as septic tank absorption fields, a system to lower the seasonal water table can be installed or the size of the absorption field can be increased so that performance is satisfactory.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons have a nearly level floor and cut slopes or embankments of compacted soil material. Aerobic lagoons generally are designed to hold sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Soils that are very high in content of organic matter and those that have cobbles, stones, or boulders are not suitable. Unless the soil has very slow permeability, contamination of ground water is a hazard where the seasonal high water table is above the level of the lagoon floor. In soils where the water table is seasonally high, seepage of ground water into the lagoon can seriously reduce the lagoon's capacity for liquid waste. Slope, depth to bedrock, and susceptibility to flooding also affect the suitability of sites for sewage lagoons or the cost of construction. Shear strength and permeability of

compacted soil material affect the performance of embankments.

Sanitary landfill is a method of disposing of solid waste by placing refuse in successive layers either in excavated trenches or on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil material. Landfill areas are subject to heavy vehicular traffic. Risk of polluting ground water and trafficability affect the suitability of a soil for this use. The best soils have a loamy or silty texture, have moderate to slow permeability, are deep to a seasonal water table, and are not subject to flooding. Clayey soils are likely to be sticky and difficult to spread. Sandy or gravelly soils generally have rapid permeability, which might allow noxious liquids to contaminate ground water. Soil wetness can be a limitation, because operating heavy equipment on a wet soil is difficult. Seepage into the refuse increases the risk of pollution of ground water.

Ease of excavation affects the suitability of a soil for the trench type of landfill. A suitable soil is deep to bedrock and free of large stones and boulders. If the seasonal water table is high, water will seep into trenches.

Unless otherwise stated, the limitations in table 9 apply only to the soil material within a depth of about 6 feet. If the trench is deeper, a limitation of slight or moderate may not be valid. Site investigation is needed before a site is selected.

Daily cover for landfill should be soil that is easy to excavate and spread over the compacted fill in wet and dry periods. Soils that are loamy or silty and free of stones or boulders are better than other soils. Clayey soils may be sticky and difficult to spread; sandy soils may be subject to soil blowing.

The soils selected for final cover of landfills should be suitable for growing plants. Of all the horizons, the A horizon in most soils has the best workability, more organic matter, and the best potential for growing plants. Thus, for either the area- or trench-type landfill, stockpiling material from the A horizon for use as the surface layer of the final cover is desirable.

Where it is necessary to bring in soil material for daily or final cover, thickness of suitable soil material available and depth to a seasonal high water table in soils surrounding the sites should be evaluated. Other factors to be evaluated are those that affect reclamation of the borrow areas. These factors include slope, erodibility, and potential for plant growth.

Construction materials

The suitability of each soil as a source of roadfill, sand, gravel, and topsoil is indicated in table 10 by ratings of good, fair, or poor. The texture, thickness, and organic-matter content of each soil horizon are important factors in rating soils for use as construction materials. Each soil is evaluated to the depth observed, generally about 6 feet.

Roadfill is soil material used in embankments for roads. Soils are evaluated as a source of roadfill for low embankments, which generally are less than 6 feet high and less exacting in design than high embankments. The ratings reflect the ease of excavating and working the material and the expected performance of the material where it has been compacted and adequately drained. The performance of soil after it is stabilized with lime or cement is not considered in the ratings, but information about some of the soil properties that influence such performance is given in the descriptions of the soil series.

The ratings apply to the soil material between the surface and a depth of 5 to 6 feet. It is assumed that soil horizons will be mixed during excavation and spreading. Many soils have horizons of contrasting suitability within their profile. The estimated engineering properties in table 14 provide specific information about the nature of each horizon. This information can help determine the suitability of each horizon for roadfill.

Soils rated *good* are coarse grained. They have low shrink-swell potential, low potential frost action, and few cobbles and stones. They are at least moderately well drained and have slopes of 15 percent or less. Soils rated *fair* have a plasticity index of less than 15 and have other limiting features, such as moderate shrink-swell potential, moderately steep slopes, wetness, or many stones. If the thickness of suitable material is less than 3 feet, the entire soil is rated *poor*.

Sand and *gravel* are used in great quantities in many kinds of construction. The ratings in table 10 provide guidance as to where to look for probable sources and are based on the probability that soils in a given area contain sizable quantities of sand or gravel. A soil rated *good* or *fair* has a layer of suitable material at least 3 feet thick, the top of which is within a depth of 6 feet. Coarse fragments of soft bedrock material, such as shale and siltstone, are not considered to be sand and gravel. Fine-grained soils are not suitable sources of sand and gravel.

The ratings do not take into account depth to the water table or other factors that affect excavation of the material. Descriptions of grain size, kinds of minerals, reaction, and stratification are given in the soil series descriptions and in table 14.

Topsoil is used in areas where vegetation is to be established and maintained. Suitability is affected mainly by the ease of working and spreading the soil material in preparing a seedbed and by the ability of the soil material to support plantlife. Also considered is the damage that can result at the area from which the topsoil is taken.

The ease of excavation is influenced by the thickness of suitable material, wetness, slope, and amount of stones. The ability of the soil to support plantlife is deter-

mined by texture, structure, and the amount of soluble salts or toxic substances. Organic matter in the A1 or Ap horizon greatly increases the absorption and retention of moisture and nutrients. Therefore, the soil material from these horizons should be carefully preserved for later use.

Soils rated *good* have at least 16 inches of friable loamy material at their surface. They are free of stones and cobbles, are low in content of gravel, and have gentle slopes. They are low in soluble salts that can limit or prevent plant growth. They are naturally fertile or respond well to fertilizer. They are not so wet that excavation is difficult during most of the year.

Soils rated *fair* are loose sandy soils or firm loamy or clayey soils in which the suitable material is only 8 to 16 inches thick or soils that have appreciable amounts of gravel, stones, or soluble salt.

Soils rated *poor* are very sandy soils and very firm clayey soils; soils with suitable layers less than 8 inches thick; soils having large amounts of gravel, stones, or soluble salt; steep soils; and poorly drained soils.

Although a rating of *good* is not based entirely on high content of organic matter, a surface horizon is generally preferred for topsoil because of its organic-matter content. This horizon is designated as A1 or Ap in the soil series descriptions. The absorption and retention of moisture and nutrients for plant growth are greatly increased by organic matter.

Water management

Many soil properties and site features that affect water management practices have been identified in this soil survey. In table 11, soil and site features that affect use are indicated for each kind of soil. This information is significant in planning, installing, and maintaining water control structures.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have a low seepage potential, which is determined by permeability and the depth to fractured or permeable bedrock or other permeable material.

Embankments, dikes, and levees require soil material that is resistant to seepage, erosion, and piping and has favorable stability, shrink-swell potential, shear strength, and compaction characteristics. Large stones and organic matter in a soil downgrade the suitability of a soil for use in embankments, dikes, and levees.

Aquifer-fed excavated ponds are bodies of water made by excavating a pit or dugout into a ground-water aquifer. Excluded are ponds that are fed by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Ratings in table 11 are for ponds that are properly designed, located, and constructed. Soil properties and site features that affect aquifer-fed ponds are depth to a permanent water table, permeability of the aquifer, quality of the water, and ease of excavation.

Drainage of soil is affected by such soil properties as permeability; texture; depth to bedrock, hardpan, or other layers that affect the rate of water movement; depth to the water table; slope; stability of ditchbanks; susceptibility to flooding; salinity and alkalinity; and availability of outlets for drainage.

Grassed waterways are constructed to channel runoff to outlets at a nonerosive velocity. Features that affect the use of soils for waterways are slope, permeability, erodibility, wetness, and suitability for permanent vegetation.

Recreation

The soils of the survey area are rated in table 12 according to limitations that affect their suitability for recreation uses. The ratings are based on such restrictive soil features as flooding, wetness, slope, and texture of the surface layer. Not considered in these ratings, but important in evaluating a site, are location and accessibility of the area, size and shape of the area and its scenic quality, the ability of the soil to support vegetation, access to water, potential water impoundment sites available, and either access to public sewerlines or capacity of the soil to absorb septic tank effluent. Soils subject to flooding are limited, in varying degree, for recreation use by the duration and intensity of flooding and the season when flooding occurs. Onsite assessment of height, duration, intensity, and frequency of flooding is essential in planning recreation facilities.

The degree of the limitation of the soils is expressed as slight, moderate, or severe. *Slight* means that the soil properties are generally favorable and that the limitations are minor and easily overcome. *Moderate* means that the limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 12 can be supplemented by information in other parts of this survey. Especially helpful are interpretations for septic tank absorption fields, given in table 9, and interpretations for dwellings without basements and for local roads and streets, given in table 8.

Camp areas require such site preparation as shaping and leveling for tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils for this use have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and

stones or boulders can greatly increase the cost of constructing camping sites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for use as picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that will increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones or boulders, is firm after rains, and is not dusty when dry. If shaping is required to obtain a uniform grade, the depth of the soil over bedrock or hardpan should be enough to allow necessary grading.

Paths and trails for walking, horseback riding, bicycling, and other uses should require little or no cutting and filling. The best soils for this use are those that are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once during the annual period of use. They should have moderate slopes and have few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They should have a surface that is free of stones and boulders and have moderate slopes. Suitability of the soil for traps, tees, or greens was not considered in rating the soils. Irrigation is an assumed management practice.

Wildlife habitat

Robert W. Franzen, biologist, Soil Conservation Service, Amherst, Mass., assisted in preparing this section.

The extent and type of vegetation in the survey area is sufficient to provide habitat for most species of wildlife common to Massachusetts. The acreage in urban and suburban uses is dominant enough, however, to limit the population of such species as black bear and white-tailed deer, which require a large habitat area.

Town conservation areas, town forests, privately owned properties, and Federal and State lands, including several areas operated by the Massachusetts Division of Fisheries and Wildlife, provide much of the wildlife habitat in the area. The largest of these is the the Parker River National Wildlife Refuge. This 4,650-acre area is owned and operated by the U.S. Fish and Wildlife Service. It encompasses Plum Island, a coastal island bordered by the ocean and tidal marsh, and serves as a resting and feeding area for ducks, geese, and shorebird.

Soils directly affect the kind and amount of vegetation that is available to wildlife as food and cover, and they affect the construction of water impoundments (*1*). The kind and abundance of wildlife that populate an area depend largely on the amount and distribution of food, cover, and water. If any one of these elements is missing, is inadequate, or is inaccessible, wildlife either are scarce or do not inhabit the area.

If the soils have the potential, wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by helping the natural establishment of desirable plants.

In table 13, the soils in the survey area are rated according to their potential to support the main kinds of wildlife habitat in the area. This information can be used in planning for parks, wildlife refuges, nature study areas, and other developments for wildlife; selecting areas that are suitable for wildlife; selecting soils that are suitable for creating, improving, or maintaining specific elements of wildlife habitat; and determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* means that the element of wildlife habitat or the kind of habitat is easily created, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected if the soil is used for the designated purpose. A rating of *fair* means that the element of wildlife habitat or kind of habitat can be created, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* means that limitations are severe for the designated element or kind of wildlife habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* means that restrictions for the element of wildlife habitat or kind of wildlife are very severe, and that unsatisfactory results can be expected. Wildlife habitat is impractical or even impossible to create, improve, or maintain on soils having such a rating.

The elements of wildlife habitat are briefly described in the following paragraphs.

Grain and seed crops are seed-producing annuals used by wildlife. The major soil properties that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, buckwheat, oats, and rye.

Grasses and legumes are domestic perennial grasses and herbaceous legumes that are planted for wildlife food and cover. Major soil properties that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also consider-

ations. Examples of grasses and legumes are fescue, timothy, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds, that provide food and cover for wildlife. Major soil properties that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggar-tick, curled dock, and buttercup.

Hardwood trees and the associated woody understory provide cover for wildlife and produce nuts or other fruit, buds, catkins, twigs, bark, or foliage that wildlife eat. Major soil properties that affect growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of native plants are red oak, black cherry, red maple, honeysuckle, quaking aspen, hawthorn, silky dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are commercially available and suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants are cone-bearing trees, shrubs, or ground cover plants that furnish habitat or supply food in the form of browse, seeds, or fruitlike cones. Soil properties that have a major effect on the growth of coniferous plants are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are white pine, red pine, eastern redcedar, and common juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites, exclusive of submerged or floating aquatics. They produce food or cover for wildlife that use wetland as habitat. Major soil properties affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, cattail, arrowhead, cordgrass, rushes, and sedges.

Shallow water areas are bodies of water that have an average depth of less than 5 feet and that are useful to wildlife. They can be naturally wet areas, or they can be created by dams or levees or by water-control structures in marshes or streams. Major soil properties affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. The availability of a dependable water supply is important if water areas are to be developed. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The kinds of wildlife habitat are briefly described in the following paragraphs.

Openland habitat consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The kinds of wildlife attracted to these areas include woodchuck, mourning dove, meadowlark, field sparrow, eastern cottontail rabbit, and red fox.

Woodland habitat consists of areas of hardwoods or conifers, or a mixture of both, and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, porcupine, and deer mice.

Wetland habitat consists of open, marshy or swampy, shallow water areas where water-tolerant plants grow. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, snapping turtle, and beaver.

Soil properties

Extensive data about soil properties are summarized on the following pages. The two main sources of these data are the many thousands of soil borings made during the course of the survey and the laboratory analyses of selected soil samples from typical profiles.

In making soil borings during field mapping, soil scientists can identify several important soil properties. They note the seasonal soil moisture condition or the presence of free water and its depth. For each horizon in the profile, they note the thickness and color of the soil material; the texture, or amount of clay, silt, sand, and gravel or other coarse fragments; the structure, or the natural pattern of cracks and pores in the undisturbed soil; and the consistence of the soil material in place under the existing soil moisture conditions. They record the depth of plant roots, determine the pH or reaction of the soil, and identify any free carbonates.

Samples of soil material are analyzed in the laboratory to verify the field estimates of soil properties and to determine all major properties of key soils, especially properties that cannot be estimated accurately by field observation. Laboratory analyses are not conducted for all soil series in the survey area, but laboratory data for many soil series not tested are available from nearby survey areas.

The available field and laboratory data are summarized in tables. The tables give the estimated range of engineering properties, the engineering classifications, and the physical and chemical properties of each major horizon of each soil in the survey area. They also present data about pertinent soil and water features.

Engineering properties

Table 14 gives estimates of engineering properties and classifications for the major horizons of each soil in the survey area.

Most soils have, within the upper 5 or 6 feet, horizons of contrasting properties. Table 14 gives information for each of these contrasting horizons in a typical profile.

Depth to the upper and lower boundaries of each horizon is indicated. More information about the range in depth and about other properties in each horizon is given for each soil series in the section "Soil series and morphology."

Texture is described in table 14 in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in soil material that is less than 2 millimeters in diameter. "Loam," for example, is soil material that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If a soil contains gravel or other particles coarser than sand, an appropriate modifier is added, for example, "gravelly loam." Other texture terms are defined in the Glossary.

The two systems commonly used in classifying soils for engineering use are the Unified soil classification system (Unified) (*3*) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO) (*2*).

The *Unified* system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter, plasticity index, liquid limit, and organic-matter content. Soils are grouped into 15 classes—eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes have a dual classification symbol, for example, CL-ML.

The *AASHTO* system classifies soils according to those properties that affect their use in highway construction and maintenance. In this system a mineral soil is classified in one of seven basic groups ranging from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines. At the other extreme, in group A-7, are fine-grained soils. Highly organic soils are classified in group A-8 on the basis of visual inspection.

When laboratory data are available, the A-1, A-2, and A-7 groups are further classified as follows: A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, and A-7-6. As an additional refinement, the desirability of soils as subgrade material can be indicated by a group index number. These numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The estimated classification, without group index numbers, is given in table 14. Also in table 14 the percentage, by weight, of rock fragments more than 3 inches in diameter is estimated for each major horizon. These estimates are determined mainly by observing volume percentage in the field and then converting that, by formula, to weight percentage.

Percentage of the soil material less than 3 inches in diameter that passes each of four sieves (U.S. standard) is estimated for each major horizon. The estimates are based on tests of soils that were sampled in the survey area and in nearby areas and on field estimates from many borings made during the survey.

Liquid limit and *plasticity index* indicate the effect of water on the strength and consistence of soil. These indexes are used in both the Unified and AASHTO soil classification systems. They are also used as indicators in making general predictions of soil behavior. Range in liquid limit and plasticity index are estimated on the basis of test data from the survey area or from nearby areas and on observations of the many soil borings made during the survey.

In some surveys, the estimates are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount across classification boundaries (1 or 2 percent), the classification in the marginal zone is omitted.

Physical and chemical properties

Table 15 shows estimated values for several soil characteristics and features that affect behavior of soils in engineering uses. These estimates are given for each major horizon, at the depths indicated, in the typical pedon of each soil. The estimates are based on field observations and on test data for these and similar soils.

Permeability is estimated on the basis of known relationships among the soil characteristics observed in the field—particularly soil structure, porosity, and gradation or texture—that influence the downward movement of water in the soil. The estimates are for vertical water movement when the soil is saturated. Not considered in the estimates is lateral seepage or such transient soil features as plowpans and surface crusts. Permeability of the soil is an important factor to be considered in planning and designing drainage systems, in evaluating the potential of soils for septic tank systems and other waste disposal systems, and in many other aspects of land use and management.

Available water capacity is rated on the basis of soil characteristics that influence the ability of the soil to hold water and make it available to plants. Important characteristics are content of organic matter, soil texture, and soil structure. Shallow-rooted plants are not likely to use the available water from the deeper soil horizons. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design of irrigation systems.

Soil reaction is expressed as a range in pH values. The range in pH of each major horizon is based on many field checks. For many soils, the values have been verified by laboratory analyses. Soil reaction is important in selecting the crops, ornamental plants, or other plants to

be grown; in evaluating soil amendments for fertility and stabilization; and in evaluating the corrosivity of soils.

Shrink-swell potential depends mainly on the amount and kind of clay in the soil. Laboratory measurements of the swelling of undisturbed clods were made for many soils. For others the swelling was estimated on the basis of the kind and amount of clay in the soil and on measurements of similar soils. The size of the load and the magnitude of the change in soil moisture content also influence the swelling of soils. Shrinking and swelling of some soils can cause damage to building foundations, basement walls, roads, and other structures unless special designs are used. A high shrink-swell potential indicates that special design and added expense may be required if the planned use of the soil will not tolerate large volume changes.

Erosion factors are used to predict the erodibility of a soil and its tolerance to erosion in relation to specific kinds of land use and treatment. The soil erodibility factor (K) is a measure of the susceptibility of the soil to erosion by water. Soils having the highest K values are the most erodible. K values range from 0.10 to 0.64. To estimate annual soil loss per acre, the K value of a soil is modified by factors representing plant cover, grade and length of slope, management practices, and climate. The soil-loss tolerance factor (T) is the maximum rate of soil erosion, whether from rainfall or soil blowing, that can occur without reducing crop production or environmental quality. The rate is expressed in tons of soil loss per acre per year.

Soil and water features

Table 16 contains information helpful in planning land uses and engineering projects that are likely to be affected by soil and water features.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are placed in one of four groups on the basis of the intake of water after the soils have been wetted and have received precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist chiefly of deep, well drained to excessively drained sands or gravels. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils that have a layer that impedes the downward movement of water or soils that have moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clay soils that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding is the temporary covering of soil with water from overflowing streams, with runoff from adjacent slopes, and by tides. Water standing for short periods after rains or after snow melts is not considered flooding, nor is water in swamps and marshes. Flooding is rated in general terms that describe the frequency and duration of flooding and the time of year when flooding is most likely. The ratings are based on evidence in the soil profile of the effects of flooding, namely thin strata of gravel, sand, silt, or, in places, clay deposited by floodwater; irregular decrease in organic-matter content with increasing depth; and absence of distinctive soil horizons that form in soils of the area that are not subject to flooding. The ratings are also based on local information about floodwater levels in the area and the extent of flooding and on information that relates the position of each soil on the landscape to historic floods.

The generalized description of flood hazards is of value in land-use planning and provides a valid basis for land-use restrictions. The soil data are less specific, however, than those provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table is the highest level of a saturated zone more than 6 inches thick for a continuous period of more than 2 weeks during most years. The depth to a seasonal high water table applies to undrained soils. Estimates are based mainly on the relationship between grayish colors or mottles in the soil and the depth to free water observed in many borings made during the course of the soil survey. Indicated in table 16 are the depth to the seasonal high water table; the kind of water table, that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. Only saturated zones above a depth of 5 or 6 feet are indicated.

Information about the seasonal high water table helps in assessing the need for specially designed foundations, the need for specific kinds of drainage systems, and the need for footing drains to insure dry basements. Such information is also needed to decide whether or not construction of basements is feasible and to determine how septic tank absorption fields and other underground installations will function. Also, a seasonal high water table affects ease of excavation.

Potential frost action refers to the likelihood of damage to pavements and other structures by frost heaving and low soil strength after thawing. Frost action results from the movement of soil moisture into the

freezing temperature zone in the soil, which causes ice lenses to form. Soil texture, temperature, moisture content, porosity, permeability, and content of organic matter are the most important soil properties that affect frost action. It is assumed that the soil is not covered by insulating vegetation or snow and is not artificially drained. Silty and clayey soils that have a high water table in winter are most susceptible to frost action. Well drained very gravelly or sandy soils are the least susceptible.

Risk of corrosion pertains to potential soil-induced chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to soil moisture, particle-size distribution, total acidity, and electrical conductivity of the soil material. The rate of corrosion of concrete is based mainly on the sulfate content, texture, and acidity of the soil. Protective measures for steel or more resistant concrete help to avoid or minimize damage resulting from the corrosion. Uncoated steel intersecting soil boundaries or soil horizons is more susceptible to corrosion than an installation that is entirely within one kind of soil or within one soil horizon.

Soil series and morphology

In this section, each soil series recognized in the survey area is described in detail. The descriptions are arranged in alphabetic order by series name.

Characteristics of the soil and the material in which it formed are discussed for each series. The soil is then compared to similar soils and to nearby soils of other series. Then a pedon, a small three-dimensional area of soil that is typical of the soil series in the survey area, is described. The detailed descriptions of each soil horizon follow standards in the Soil Survey Manual (*5*). Unless otherwise noted, colors described are for moist soil.

Following the pedon description is the range of important characteristics of the soil series in this survey area. Phases, or map units, of each soil series are described in the section "Soil maps for detailed planning."

Agawam series

The Agawam series consists of coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts. The soils are deep and well drained. They formed in acid glacial outwash material derived mainly from granite, gneiss, and schist. Agawam soils are on outwash plains and stream terraces. Slopes range from 0 to 15 percent.

Agawam soils formed in the same kind of material as moderately well drained Ninigret soils and poorly drained Walpole soils. They are similar to the Merrimac, Unadilla, and Windsor soils. Agawam soils have less gravel in the substratum than the Merrimac soils, have more fine sand and less very fine sand than the Unadilla soils, and have less sand in the solum than the Windsor soils.

Typical pedon of Agawam fine sandy loam, 3 to 8 percent slopes, in the city of Newburyport, in a wooded area 500 feet west-northwest of the junction of Moseley Avenue and Merrimac Street:

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; very friable; many fine medium and coarse roots; strongly acid; abrupt smooth boundary.

B2—9 to 30 inches; yellowish brown (10YR 5/6) fine sandy loam; weak fine granular structure; very friable; common fine medium and coarse roots; medium acid; abrupt smooth boundary.

IIC—30 to 60 inches; light olive brown (2.5Y 5/4) stratified fine sand and loamy fine sand; single grain; loose; few fine roots in upper part; strongly acid.

The solum thickness ranges from 20 to 35 inches. Coarse fragments make up 0 to 10 percent in the solum, 0 to 30 percent of the C horizon above a depth of 40 inches, and 0 to 60 percent of the C horizon below a depth of 40 inches. Reaction in unlimed areas is very strongly acid to medium acid.

The Ap horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 to 4. It is fine sandy loam or very fine sandy loam.

The B horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 4 to 6.

The IIC horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 2 to 4. It is stratified loamy fine sand, loamy sand, fine sand, sand, or their gravelly analogues.

Amostown series

The Amostown series consists of coarse-loamy, mixed, mesic Typic Dystrochrepts. The soils are deep and moderately well drained. They formed in glacial outwash derived mainly from mica schist and gneiss. Amostown soils are on old lakebeds and deltas. Slopes range from 0 to 8 percent.

Amostown soils formed in the same kind of material as poorly drained Walpole Variant soils. They are similar to Belgrade, Elmwood, and Ninigret soils. Amostown soils have more fine sand and less very fine sand than the Belgrade soils, have less sand in the substratum than the Belgrade or Ninigret soils, and have less clay in the substratum than the Elmwood soils.

Typical pedon of Amostown fine sandy loam, 0 to 3 percent slopes, in the town of Amesbury, in an idle field 100 feet north of Pleasant Valley Road, 0.5 mile east of its junction with Buttonwood Road:

Ap—0 to 11 inches; dark grayish brown (10YR 4/2) fine sandy loam; very weak fine and medium granular

structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

B21—11 to 14 inches; yellowish brown (10YR 5/6) fine sandy loam; very weak fine and medium granular structure; very friable; common fine roots; strongly acid; abrupt wavy boundary.

B22—14 to 24 inches; dark yellowish brown (10YR 4/4) fine sandy loam; very weak fine and medium granular structure; very friable; few fine roots; strongly acid; clear wavy boundary.

B23—24 to 38 inches; light olive brown (2.5Y 5/4) fine sandy loam; few fine distinct grayish brown (2.5Y 5/2) and reddish brown (5YR 4/4) mottles; very weak fine and medium granular structure; very friable; strongly acid; clear wavy boundary.

IIC—38 to 60 inches; light olive brown (2.5Y 5/4) silt loam; many medium and coarse prominent light brownish gray (2.5Y 6/2), strong brown (7.5YR 5/6), and dark red (2.5YR 3/6) mottles; massive; friable, nonsticky; medium acid.

The thickness of the solum and the depth to the underlying silty material range from 22 to 40 inches. Depth to mottling ranges from 16 to 30 inches. The mottles at a depth of less than 24 inches have chroma of more than 2. The solum is strongly acid or very strongly acid except where limed.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4. The A1 horizon, where present, is 1 or 2 units darker in value or chroma or both. The A horizon is sandy loam, fine sandy loam, or loam.

The upper part of the B horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 5 or 6. The lower part of the B horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 6 and is mottled. The B horizon is sandy loam or fine sandy loam.

The IIC horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 2 to 4 and is distinctly or prominently mottled. It is silt or silt loam and in places is stratified or varved.

Belgrade series

The Belgrade series consists of coarse-silty, mixed, mesic Aquic Dystric Eutrochrepts. These deep, moderately well drained soils are on outwash plains. They formed in lakebed deposits of very fine sandy loam and silt loam derived mainly from schist and gneiss. Slopes range from 0 to 15 percent.

Belgrade soils formed in the same kind of material as very poorly drained Birdsall soils, poorly drained Raynham soils, and well drained Unadilla soils. They are similar to Amostown, Buxton, and Ninigret soils. Belgrade soils have more very fine sand and less fine sand than the Amostown or Ninigret soils, have more sand in the substratum than the Amostown soils, and have more sand and less silt than the Buxton soils.

Typical pedon of Belgrade very fine sandy loam, 0 to 3 percent slopes, in the town of Amesbury, in a cultivated field 550 feet north of Pleasant Valley Road and 700 feet east of the Amesbury-Merrimac town line:

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) very fine sandy loam; very weak fine and medium granular structure; very friable; many fine roots; slightly acid; abrupt smooth boundary.

B21—9 to 20 inches; yellowish brown (10YR 5/6) very fine sandy loam; weak fine granular structure; very friable; common fine roots; strongly acid; clear wavy boundary.

B22—20 to 30 inches; light olive brown (2.5Y 5/4) very fine sandy loam; few fine faint gray (5Y 5/1) and strong brown (7.5YR 5/6) mottles that increase in size, abundance, and contrast with depth; massive; very friable; few very fine roots; medium acid; clear wavy boundary.

C1—30 to 42 inches; light olive brown (2.5Y 5/4) very fine sandy loam; many medium and coarse prominent gray (5Y 6/1), yellowish red (5YR 4/6), and strong brown (7.5YR 5/6) mottles; massive; very friable; slightly acid; abrupt wavy boundary.

C2—42 to 60 inches; gray (5Y 6/1) loamy very fine sand; lenses of fine sand; many coarse prominent yellowish red (5YR 4/6) and strong brown (7.5YR 5/6) mottles; massive; very friable; neutral.

The thickness of the solum ranges from 20 to 30 inches. The depth to mottling ranges from 12 to 24 inches. There are few or no coarse fragments within 40 inches of the surface. In some pedons thin strata of sand or gravel are below a depth of 40 inches. The solum is medium acid to strongly acid, and the substratum is slightly acid to neutral.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. It is typically very fine sandy loam but ranges to silt loam.

The B21 horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 4 to 6. The B22 horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 4 through 6 and is mottled. The B horizon ranges from silt loam to very fine sandy loam.

The C horizon has hue of 2.5Y or 5Y, value of 5 or 6, and chroma of 1 to 4 and is mottled. It is typically very fine sandy loam but in places has varves of very fine sand, loamy very fine sand, or light silt loam.

Birdsall series

The Birdsall series consists of coarse-silty, mixed, nonacid, mesic Typic Humaquepts. These deep, very poorly drained soils are on outwash plains and old lakebeds. They formed in acid glaciolacustrine deposits derived mainly from mica schist and gneiss. Slopes range from 0 to 3 percent.

Birdsall soils formed in the same kind of material as moderately well drained Belgrade soils, poorly drained Raynham soils, and well drained Unadilla soils. They are similar to Maybid, Saco Variant, and Whately Variant soils. Birdsall soils have less clay than the Maybid soils, have more silt and less sand in the substratum than the Saco Variant soils, and have less sand in the solum than the Whately Variant soils.

Typical pedon of Birdsall silt loam, in the town of Andover, in an idle area near the center of the oval formed by the River Road exit ramp on Interstate 93 northbound:

A1—0 to 8 inches; black (10YR 2/1) silt loam; weak fine granular structure; friable; many fine roots; strongly acid; abrupt irregular boundary.

Bg—8 to 25 inches; dark grayish brown (2.5Y 4/2) very fine sandy loam; common medium and coarse prominent reddish brown (2.5YR 4/4) mottles; massive; friable; common fine roots; strongly acid; clear wavy boundary.

Cg—25 to 60 inches; gray (5Y 5/1) silt loam consisting of varved silt, silt loam, and very fine sand; massive; firm, slightly plastic; medium acid.

The thickness of the solum and the depth to the varved materials range from 16 to 30 inches. Coarse fragments make up 0 to 3 percent of the profile. Reaction is strongly acid to medium acid in the A1 horizon and strongly acid to neutral in the B and C horizons. Some pedons have thin muck or peat on the surface.

The A1 horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 2. It is silt loam or very fine sandy loam.

The B horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 0 to 2 and is mottled. It is very fine sandy loam or silt loam.

The C horizon has hue of 2.5Y or 5Y, value of 4 to 7, and chroma of 0 to 2. It consists of varves of silt, silt loam, and very fine sand in any combination, and when mixed has textures of silt loam, very fine sandy loam, or loamy very fine sand. Layers of sandy or gravelly material less than 3 inches thick are in some pedons.

Buxton series

The Buxton series consists of fine, mixed, mesic Aquic Dystric Eutrochrepts. These deep, moderately well drained soils are on outwash plains and old lakebeds. The soils formed in acid to neutral glaciolacustrine deposits derived mainly from mica schist. Slopes range from 0 to 25 percent.

Buxton soils formed in the same kind of material as very poorly drained Maybid soils, poorly drained Scantic soils, and well drained Suffield soils. They are similar to the Belgrade and Elmwood soils. Buxton soils have more silt and less sand in the solum than the Belgrade or Elmwood soils.

Typical pedon of Buxton silt loam, 0 to 3 percent slopes, in the town of Newbury, in a cultivated field, 350 feet northwest of Orchard Street, about 1/2 mile west of its intersection of Middle Street:

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) silt loam; moderate fine granular structure; friable, nonsticky; many fine roots; slightly acid; abrupt smooth boundary.

B21—10 to 14 inches; yellowish brown (10YR 5/4) silt loam; moderate fine granular structure; friable; nonsticky; common fine roots; medium acid; gradual smooth boundary.

B22—14 to 22 inches; light olive brown (2.5Y 5/4) silt loam; moderate fine and medium granular structure; friable, nonsticky; few fine roots; medium acid; clear wavy boundary.

B23—22 to 26 inches; light yellowish brown (2.5Y 6/4) silty clay loam; few medium distinct gray (5Y 6/1) and yellowish brown (10YR 5/8) mottles; moderate thin platy structure; firm, slightly sticky, slightly plastic; slightly acid; gradual smooth boundary.

B24—26 to 30 inches; light yellowish brown (2.5Y 6/4) silty clay loam; many medium prominent gray (5Y 6/1) and yellowish brown (10YR 5/8) mottles; moderate medium platy structure; firm, slightly sticky, slightly plastic; thin very dusky red (2.5YR 2/2) splotches on ped faces; slightly acid; abrupt wavy boundary.

C—30 to 60 inches; light yellowish brown (2.5Y 6/4) silty clay; many medium prominent gray (5Y 5/1) and strong brown (7.5YR 5/8) mottles; varved silts and clays with thin lenses of very fine sand; massive; firm, sticky, plastic; thin discontinuous clay flows and thin very dusky red (2.5YR 2/2) splotches on ped faces; slightly acid.

The thickness of the solum ranges from 24 to 40 inches. The depth to mottling ranges from 15 to 24 inches. The profile is typically free of coarse fragments, but a few granite or quartzite pebbles are in some places. The reaction in the upper part of the solum ranges from strongly acid to slightly acid in unlimed areas. The lower part of the solum and the substratum are medium acid to neutral.

The Ap horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 2 or 3. It is typically silt loam but includes silty clay loam.

The upper part of the B horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 to 6. It is typically silt loam but includes silty clay loam. The lower part of the B horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 2 to 6 and is mottled. It is silty clay loam, silty clay, or clay. Structure is moderate or strong platy or blocky. Thin, dusky red films and discontinuous, light

gray coatings or splotches are on ped faces in some pedons.

The C horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 2 to 6. Some pedons do not have mottles. The texture is silty clay loam, silty clay, or clay. The horizon has platy (varve-controlled) or prismatic structure or is massive.

Canton series

The Canton series consists of coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts. These deep, well drained soils are on uplands. The soils formed in acid glacial till derived mainly from gneiss and granite. Slopes range from 0 to 35 percent.

Canton soils are similar to Charlton and Montauk soils. Canton soils have more sand in the substratum than the Charlton soils. They do not have a fragipan, which the Montauk soils have.

Typical pedon of Canton fine sandy loam, 3 to 8 percent slopes, in the city of Haverhill, in a wooded area 500 feet southwest of the junction of Bradely Avenue and River Street:

Ap—0 to 7 inches; dark brown (10YR 3/3) fine sandy loam; weak fine granular structure; very friable; many fine roots; less than 5 percent gravel, 5 percent cobblestones; very strongly acid; abrupt smooth boundary.

B21—7 to 16 inches; brown (7.5YR 4/4) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; 5 percent gravel, 5 percent cobblestones; very strongly acid; clear wavy boundary.

B22—16 to 27 inches; yellowish brown (10YR 5/6) fine sandy loam; weak fine granular structure; very friable; common fine roots; 10 percent gravel, 5 percent cobblestones, 5 percent stones; strongly acid; clear wavy boundary.

B3—27 to 33 inches; light olive brown (2.5Y 5/4) fine sandy loam; very weak fine and medium granular structure; friable; common fine roots; 10 percent gravel, 5 percent cobblestones, 5 percent stones; strongly acid; abrupt wavy boundary.

IIC—33 to 60 inches; light brownish gray (2.5Y 6/2) gravelly loamy sand; single grain; loose; few fine roots in upper part; 20 percent angular gravel, 10 percent cobblestones; strongly acid.

The solum thickness ranges from 18 to 36 inches and corresponds closely to the depth to the underlying coarse-textured till. Coarse fragments less than 10 inches in diameter make up 5 to 25 percent of the solum and 20 to 40 percent of the IIC horizon. The reaction of the profile ranges from extremely acid through strongly acid in unlimed areas.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 to 3. It is loam, fine sandy loam, or very fine sandy loam.

The B21 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 8. The lower part of the B horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 4 or 6. The texture of the B horizon is loam, fine sandy loam, or very fine sandy loam. The B horizon has weak granular structure or is massive.

The IIC horizon has hue of 2.5Y or 5Y, value of 5 to 7, and chroma of 2 or 3. It is typically gravelly loamy sand but includes loamy fine sand and gravelly loamy coarse sand.

Carver series

The Carver series consists of mixed, mesic Typic Udipsamments. These deep, excessively drained soils are on stream terraces and outwash plains. The soils formed in acid glacial outwash derived mainly from gneiss and granite. Slopes range from 0 to 8 percent.

Carver soils are similar to Hinckley and Windsor soils. Carver soils have less gravel than the Hinckley soils. They have more coarse sand than the Windsor soils.

Typical pedon of Carver loamy coarse sand, 0 to 3 percent slopes, in the town of Andover, in a wooded area on the east side of the old railroad bed, 1,600 feet north of its junction with Haggetts Pond Road:

O1—2 inches to 1 inch; very dusky red (2.5YR 2/2) partly decomposed organic debris.

O2—1 inch to 0; black (10YR 2/1) decomposed organic remains.

A1—0 to 5 inches; black (10YR 2/1) loamy coarse sand; single grain; very friable; many fine medium and coarse roots; less than 5 percent rounded fine gravel; very strongly acid; abrupt wavy boundary.

B21—5 to 10 inches; dark yellowish brown (10YR 4/4) loamy coarse sand; single grain; loose; many fine medium and coarse roots; 5 percent rounded gravel 2 to 5 millimeters in diameter; strongly acid; clear wavy boundary.

B22—10 to 19 inches; yellowish brown (10YR 5/6) loamy coarse sand; single grain; loose; common fine and medium roots; 10 percent rounded gravel 2 to 10 millimeters in diameter; strongly acid; clear wavy boundary.

IIB23—19 to 34 inches; yellowish brown (10YR 5/4) coarse sand; single grain; loose; few fine roots; 15 percent rounded gravel 2 to 25 millimeters in diameter; strongly acid; abrupt smooth boundary.

IIC—34 to 60 inches; pale brown (10YR 6/3) and light gray (10YR 7/2) stratified coarse sand; single grain; loose; 5 percent gravel 2 to 10 millimeters in diameter; strongly acid.

The solum thickness ranges from 18 to 34 inches but is commonly 24 to 30 inches. The solum and substratum generally contain less than 10 percent, by volume, coarse fragments. Pebbles less than 15 millimeters in diameter commonly make up 0 to 10 percent, by volume, of the profile, but in some pedons some strata contain up to 20 percent gravel. The reaction of the profile is typically strongly acid to extremely acid. In some areas an Ap horizon and the upper part of the B horizon are medium acid or slightly acid where limed.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. The typical texture is loamy coarse sand, but the texture ranges from loamy sand to coarse sand.

The B horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 6. It is loamy coarse sand or coarse sand.

The C horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 to 6. It is mainly coarse sand, but thin strata of fine gravel are in some pedons.

Charlton series

The Charlton series consists of coarse-loamy, mixed, mesic Typic Dystrochrepts. These deep, well drained soils are on uplands. The soils formed in glacial till. Slopes range from 3 to 55 percent.

Charlton soils formed in the same kind of material as poorly drained Leicester soils and moderately well drained Sutton soils. They are similar to the Canton, Hollis, and Paxton soils. Charlton soils have less sand in the substratum than the Canton soils, are deeper to bedrock than the Hollis soils, and do not have the fragipan of the Paxton soils.

Typical pedon of Charlton fine sandy loam, in an area of Charlton very stony fine sandy loam, 3 to 8 percent slopes, in the town of Amesbury, 1,800 feet southwest of the junction of Kimball Road and Newton Road:

O1—1 inch to 0; deciduous leaf litter.

A1—0 to 4 inches; dark brown (10YR 3/3) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; 5 percent gravel; very strongly acid; abrupt wavy boundary.

B21—4 to 11 inches; brown (7.5YR 4/4) fine sandy loam; weak fine granular structure; friable; many fine medium and coarse roots; 10 percent gravel, 5 percent angular cobblestones; very strongly acid; clear wavy boundary.

B22—11 to 28 inches; dark yellowish brown (10YR 4/4) gravelly fine sandy loam; weak fine and very fine granular structure; friable; common fine and medium roots; 15 percent gravel, 15 percent angular cobblestones; very strongly acid; abrupt wavy boundary.

C—28 to 60 inches; olive brown (2.5Y 4/4) gravelly fine sandy loam; massive; friable; 20 percent gravel, 15 percent angular cobblestones; medium acid.

The thickness of the solum ranges from about 20 to 36 inches. Stones and weathered fragments are common throughout the soil. Rock fragments make up about 5 to 35 percent of the profile. Reaction ranges from very strongly acid to medium acid in unlimed areas.

The A1 horizon has hue of 7.5YR or 10YR and value and chroma of 2 or 3. The Ap horizon, where present, has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. The A horizon is fine sandy loam or loam.

The B21 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 or 6. The B22 horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 4 or 6. The B horizon ranges from fine sandy loam to sandy loam. It has granular or blocky structure or is massive.

The C horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 2 to 4. It is fine sandy loam, sandy loam, or loam or the gravelly analogues of these textures. The C horizon is generally massive, but some pedons have thin layers with platy structure. Consistence is mainly friable or very friable, but the thin platy layers are firm.

Deerfield series

The Deerfield series consists of mixed, mesic Aquic Udipsamments. These deep, moderately well drained soils are on outwash plains. The soils formed in acid glacial outwash derived mainly from gneiss and granite. Slopes range from 0 to 3 percent.

Deerfield soils formed in the same kind of material as somewhat poorly drained Pipestone soils, poorly drained Wareham soils, and excessively drained Windsor soils. They are similar to Ninigret and Sudbury soils. Deerfield soils have more sand in the solum than the Ninigret or Sudbury soils.

Typical pedon of Deerfield loamy fine sand, in the town of Andover, in a hayfield about 0.6 mile northwest of the River Road interchange on Interstate Route 93:

Ap—0 to 9 inches; very dark brown (10YR 2/2) loamy fine sand; very weak fine and medium granular structure; very friable; many fine roots; medium acid; abrupt smooth boundary.

B21—9 to 17 inches; strong brown (7.5YR 5/6) loamy fine sand; very weak fine and medium granular structure; very friable; few fine roots; medium acid; clear smooth boundary.

B22—17 to 25 inches; yellowish brown (10YR 5/6) loamy fine sand; few fine faint brownish yellow (10YR 6/6) mottles; very weak fine granular structure; very friable; strongly acid; clear wavy boundary.

B3—25 to 33 inches; yellowish brown (10YR 5/6) fine sand; common fine and medium distinct light brownish gray (10YR 6/2) and strong brown (7.5YR 5/8) mottles; single grain; loose; strongly acid; clear discontinuous boundary.

C1—33 to 40 inches; light brownish gray (10YR 6/2) fine and medium sand; common fine prominent strong

brown (7.5YR 5/8) mottles; single grain; loose; very strongly acid; clear wavy boundary.

C2—40 to 60 inches; light brownish gray (10YR 6/2) stratified sand; common fine and medium prominent strong brown (7.5YR 5/8) mottles; single grain; loose; 10 percent rounded fine granite and quartzite gravel overall, with individual strata up to 20 percent; very strongly acid.

The solum thickness ranges from 18 to 35 inches. The depth to mottling ranges from 12 to 30 inches. The profile is typically less than 5 percent coarse fragments, but thin strata in the substratum are as much as 20 percent fine gravel. Reaction is medium acid to very strongly acid in unlimed areas.

The Ap horizon has hue of 10YR and value and chroma of 2 or 3. The A1 horizon, where present, is slightly darker. The A horizon is typically loamy fine sand but ranges from sand to fine sandy loam.

The B horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 3 to 6. It ranges from loamy fine sand to sand. The B horizon has granular structure or is single grain and has very friable or loose consistence.

The C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 3. It ranges from fine sand to coarse sand. The C horizon of some pedons does not have mottles.

Elmwood series

The Elmwood series consists of coarse-loamy over clayey, mixed, mesic Aquic Dystric Eutrochrepts. These soils are deep and moderately well drained. They formed in lakebed deposits of acid glacial outwash overlying nearly neutral clay derived from schist and gneiss. The soils are in glaciolacustrine areas, on outwash plains, and on deltas. Slopes range from 0 to 8 percent.

Elmwood soils formed in the same kind of material as well drained Melrose soils, poorly drained Swanton soils, and very poorly drained Whately Variant soils. They are similar to the Amostown and Buxton soils. Elmwood soils have more clay in the substratum than the Amostown soils. They have more sand and less silt in the solum than the Buxton soils.

Typical pedon of Elmwood fine sandy loam, 3 to 8 percent slopes, in the town of Salisbury, in a wooded area 2,500 feet southwest of the water tower on High Street:

O1—2 inches to 0; partially decomposed organic material.

A1—0 to 1 inch; very dark gray (10YR 3/1) fine sandy loam; weak fine granular structure; very friable; many fine medium and coarse roots; very strongly acid; abrupt smooth boundary.

B21—1 to 4 inches; reddish brown (5YR 4/4) fine sandy loam; weak fine granular structure; very friable; many fine medium and coarse roots; strongly acid; clear wavy boundary.

B22—4 to 11 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak fine granular structure; very friable; common fine and medium roots; strongly acid; gradual wavy boundary.

B23—11 to 21 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine granular structure; very friable; common fine and medium roots; less than 5 percent fine gravel; strongly acid; clear wavy boundary.

B24—21 to 27 inches; light olive brown (2.5Y 5/4) fine sandy loam; few fine distinct gray (10YR 6/1) and yellowish brown (10YR 5/6) mottles; massive; very friable; few fine roots; medium acid; clear wavy boundary.

B25—27 to 35 inches; yellowish brown (10YR 5/4) fine sandy loam; common fine distinct gray (10YR 6/1) and brown (7.5YR 4/4) mottles; weak fine granular structure; very friable; medium acid; abrupt wavy boundary.

IIC1—35 to 42 inches; olive (5Y 5/3) silty clay loam; common fine and medium prominent gray (10YR 6/1) and reddish brown (5YR 4/4) mottles; moderate medium platy structure; firm; thin black splotchy coatings on ped faces; slightly acid; clear wavy boundary.

IIC2—42 to 60 inches; olive (5Y 5/3) silty clay; many fine and medium prominent gray (10YR 6/1), strong brown (7.5YR 5/6), and dark reddish brown (5YR 3/4) mottles; massive; firm; slightly acid.

The depth to the underlying fine-textured material ranges from 18 to 40 inches. Some pedons have thin strata in the coarse-loamy material containing 3 to 5 percent fine gravel. The soil ranges from strongly acid to slightly acid above the lithologic discontinuity and from slightly acid to neutral below.

The A1 horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 1 to 3. The Ap horizon, where present, has chroma of 2 to 4. The A horizon is fine sandy loam, very fine sandy loam, or sandy loam.

The B horizon has hue of 5YR to 2.5Y, value of 4 or 5, and chroma of 3 to 6. It is mainly fine sandy loam or sandy loam, but thin layers of loamy fine sand or loamy sand are in some pedons.

Some pedons have a A'2 horizon and a B'2 horizon. The A'2 horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 2 to 4. It is fine sandy loam or sandy loam. The B'2 horizon formed in the underlying fine textured material. It has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 4. It is silty clay loam, clay loam, or silty clay.

The IIC horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 2 or 3. It is silty clay loam or silty clay. The structure is moderate, medium to thick, platy, or the horizon is massive. Thin films of silt or clay on the ped

faces are in some pedons. Some pedons have black oxide stains on some ped faces.

Hadley series

The Hadley series consists of coarse-silty, mixed, nonacid, mesic Typic Udifluvents. These deep, well drained soils are on flood plains. The soils formed in alluvial deposits of very fine sand and silt derived mainly from mica schist. Slopes range from 0 to 3 percent.

Hadley soils formed in the same kind of material as poorly drained Limerick soils, very poorly drained Saco Variant soils, and moderately well drained Winooski soils. They are similar to Suffield and Unadilla soils. Hadley soils have more sand and less silt than the Suffield soils. They formed in alluvial material and are less developed than the Unadilla soils.

Typical pedon of Hadley very fine sandy loam, in West Newbury, in a cultivated field 150 feet east of River Road and about 0.4 mile north of the Rock Village Bridge:

Ap—0 to 9 inches; dark brown (10YR 3/3) very fine sandy loam; weak fine granular structure; very friable; medium acid; abrupt smooth boundary.
C1—9 to 30 inches; yellowish brown (10YR 5/4) very fine sandy loam; massive; friable; slightly acid; gradual smooth boundary.
C2—30 to 56 inches; brown (10YR 5/3) very fine sandy loam; massive; friable; medium acid; gradual smooth boundary.
C3—56 to 60 inches; grayish brown (10YR 5/2) loamy very fine sand; massive; friable; medium acid.

The thickness and number of subsurface horizons corresponds to the variability of the alluvial deposits. Coarse fragments are absent or nearly absent to a depth of 40 inches. The reaction above a depth of 40 inches ranges from strongly acid to neutral.

The Ap horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 to 4. It is very fine sandy loam or silt loam.

The C horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. It is mainly silt loam through very fine sand to a depth of 40 inches, but some pedons have thin strata of loamy fine sand. Below a depth of 40 inches the texture ranges from silt loam to sand.

Hinckley series

The Hinckley series consists of sandy-skeletal, mixed, mesic Typic Udorthents. These deep, excessively drained soils are on terraces, outwash plains, deltas, kames, and eskers. The soils formed in water-sorted material. Slopes range from 0 to 35 percent.

Hinckley soils formed in the same kind of material as somewhat excessively drained Merrimac soils, moderately well drained Sudbury soils, and poorly drained Walpole soils. They are similar to Carver, Merrimac, and Windsor soils. Hinckley soils have more gravel than the Carver or Windsor soils. They have more sand and gravel in the solum than the Merrimac soils.

Typical pedon of Hinckley loamy sand, 0 to 3 percent slopes, in the town of Salisbury, in a wooded area that was once cultivated, about 0.3 mile south-southwest of the junction of Blacksnake Road and Foley Mill Road:

O1—2 inches to 1 inch; forest litter of pine needles, twigs, and branches.
O2—1 inch to 0; decomposed organic materials.
Ap—0 to 7 inches; dark brown (10YR 4/3) loamy sand; weak fine granular structure; very friable; many tree roots; 15 percent rounded gravel; 3 percent cobblestones; strongly acid; abrupt smooth boundary.
B21—7 to 13 inches; yellowish brown (10YR 5/6) gravelly loamy sand; single grain; loose; common tree roots; 35 percent rounded gravel, 3 percent cobblestones; strongly acid; abrupt smooth boundary.
B22—13 to 19 inches; yellowish brown (10YR 5/4) sand; single grain; loose; few tree roots; 15 percent rounded gravel, 3 percent cobblestones; strongly acid; abrupt smooth boundary.
IIC—19 to 60 inches; light gray (2.5Y 7/2) very gravelly sand consisting of stratified sand, gravel, and cobblestones; single grain; loose; 50 percent rounded gravel, 10 percent cobblestones; strongly acid.

The solum thickness ranges from about 13 to 24 inches. Gravel and cobblestones constitute 10 to 50 percent of the solum and 35 to 70 percent of the substratum. Reaction is typically strongly acid or very strongly acid, but it ranges from extremely acid to medium acid in areas where the surface layer is not limed.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The A1 horizon, where present, is one unit darker in value or chroma or both. The A horizon ranges from fine sandy loam to loamy coarse sand and their gravelly or cobbly analogues.

The B21 horizon has hue of 7.5YR to 10YR, value of 4 or 5, and chroma of 4 to 8. It is loamy sand or loamy coarse sand or its gravelly or cobbly analogues. The B22 horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8. It ranges from coarse sand to loamy fine sand or their gravelly, very gravelly, or cobbly analogues.

The IIC horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 to 6. It ranges from gravelly loamy fine sand to very cobbly coarse sand and is stratified.

Hollis series

The Hollis series consists of loamy, mixed, mesic Lithic Dystrochrepts. These shallow, somewhat excessively drained soils are on upland hills and ridges. The

soils formed in glacial till. Slopes range from 3 to 35 percent.

Hollis soils are similar to Canton, Charlton, Montauk, and Paxton soils but are shallower to bedrock.

Typical pedon of Hollis fine sandy loam, in an area of Charlton-Rock outcrop-Hollis complex, 3 to 8 percent slopes, in the town of Boxford, on the west roadbank of I-95, about 0.8 mile south of the Massachusetts Route 97 interchange:

O1—1 inch to 0; partially decomposed organic material.
A1—0 to 5 inches; very dark brown (10YR 2/2) fine sandy loam; weak fine and medium granular structure; friable; many fine and medium roots; 5 percent angular coarse fragments less than 3 inches in diameter; strongly acid; abrupt irregular boundary.
B21—5 to 10 inches; brown (7.5YR 4/4) fine sandy loam; weak medium granular structure; friable; many fine and medium roots; 10 percent angular coarse fragments less than 3 inches in diameter; medium acid; clear wavy boundary.
B22—10 to 16 inches; dark yellowish brown (10YR 4/4) gravelly fine sandy loam; moderate fine and medium granular structure; friable; many fine roots and common medium and coarse roots; 25 percent angular gravel, 5 percent cobblestones; medium acid; gradual discontinuous boundary.
R—16 inches; hard granite bedrock.

The solum thickness and depth to bedrock range from 10 to 20 inches. Gravel-sized coarse fragments make up 5 to 25 percent of the solum and are dominantly granite and gneiss. Some pedons have stones and boulders on the surface and in the solum. Reaction ranges from very strongly acid to medium acid in unlimed areas.

The A horizon has hue of 10YR and value and chroma of 2 or 3.

The B horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 or 6. It is fine sandy loam, loam, or sandy loam. Structure is subangular blocky or granular.

Ipswich series

The Ipswich series consists of euic, mesic Typic Sulfihemists. These deep, very poorly drained soils formed in organic deposits more than 51 inches thick. The Ipswich soils are on nearly level flats bordering the Atlantic Ocean and extending inland along the major rivers. The soils are perpetually wet and are subject to tidal flooding. Slopes are less than 1 percent.

Ipswich soils are similar to Medisaprists and Westbrook soils. Ipswich soils formed in saltwater marshes, whereas Medisaprists formed in freshwater marshes. Ipswich soils formed in thicker organic material than the Westbrook soils.

Typical pedon of Ipswich mucky peat, in an area of Ipswich and Westbrook mucky peats, in the town of Newbury, 6,700 feet east of the intersection of Cottage Road and High Road and 7,700 feet southeast of the intersection of Pine Island Road and High Road:

Oe1—0 to 18 inches; dark grayish brown (2.5Y 4/2) mucky peat; 80 percent fiber, 45 percent rubbed; dense mat of roots, stems, and leaves; friable; many very fine, fine, medium, and coarse roots; herbaceous fibers; 40 percent silt and very fine sand by weight; neutral; abrupt smooth boundary.
Oe2—18 to 42 inches; very dark grayish brown (2.5Y 3/2) mucky peat; 70 percent fibers, 25 percent rubbed; massive; very friable; 45 percent silt and very fine sand by weight; slightly acid; abrupt wavy boundary.
Oa—42 to 60 inches, very dark gray (2.5Y 3/1) muck; 20 percent fibers, 10 percent rubbed; massive; very friable; 50 percent silt and very fine sand by weight; neutral.

The organic deposit is more than 51 inches thick. Thin layers of silt or very fine sand are in some pedons. The pedon ranges from strongly acid to neutral in its natural state and is more acid when drained.

The surface tier has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 to 3. The fiber content ranges from 35 to 100 percent, and 20 to 75 percent rubbed.

The subsurface tier has hue of 10YR to 5Y, value of 2 to 4, and chroma of 1 to 3. The fiber content ranges from 20 to 85 percent, and 20 to 40 percent rubbed.

The bottom tier has hue of 2.5Y or 5Y, value of 3 or 4, and chroma of 1 to 3. The estimated fiber content is 20 to 70 percent, and 5 to 40 percent rubbed.

Leicester series

The Leicester series consists of coarse-loamy, mixed, acid, mesic Aeric Haplaquepts. These deep, poorly drained soils are on uplands. The soils formed in loamy glacial till. Slopes range from 0 to 8 percent.

Leicester soils formed in the same kind of material as well drained Charlton soils and moderately well drained Sutton soils. They are similar to the Ridgebury soils. Leicester soils do not have the fragipan of the Ridgebury soils.

Typical pedon of Leicester fine sandy loam, 0 to 3 percent slopes, in the town of Merrimac, in a wooded area 700 yards south-southwest of the Massachusetts-New Hampshire boundary on Newton Street:

O1—3 inches to 0; dark reddish brown (5YR 3/2) decaying organic material.
A1—0 to 5 inches; very dark gray (10YR 3/1) fine sandy loam; weak fine and medium granular structure; friable; many fine medium and coarse roots; 5 percent

fine and medium gravel; very strongly acid; abrupt smooth boundary.

B21—5 to 16 inches; olive (5Y 5/3) fine sandy loam; common medium prominent yellowish brown (10YR 5/6) and brown (7.5YR 4/4) mottles; weak fine and medium granular structure; friable; common fine and medium roots; 5 percent gravel; 10 percent cobblestones; strongly acid; gradual boundary.

B22—16 to 28 inches; olive gray (5Y 5/2) fine sandy loam; many moderate prominent yellowish brown (10YR 5/6) and reddish brown (5YR 4/4) mottles; weak fine and medium granular structure; friable; few fine roots; 5 percent gravel, 5 percent cobblestones; strongly acid; clear wavy boundary.

C—28 to 60 inches; olive gray (5Y 5/2) gravelly fine sandy loam; many medium prominent yellowish brown (10YR 5/6) and reddish brown (5YR 4/4) mottles; massive; firm; 10 percent gravel, 10 percent cobblestones; strongly acid.

The solum thickness ranges from 20 to 36 inches. Coarse fragments make up 5 to 35 percent of the pedon. The fragments are dominantly gravel size, but up to 15 percent are cobblestones. Stone-size fragments make up 0 to 10 percent of the pedon. The reaction in unlimed soils is very strongly acid or strongly acid in the upper 40 inches and very strongly acid to medium acid below a depth of 40 inches.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It is fine sandy loam, loam, or very fine sandy loam.

The B horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 4. The B horizon dominantly has chroma of 2 or less, but at least one subhorizon has chroma of more than 2. The horizon is fine sandy loam, loam, or sandy loam or the gravelly analogues of these textures. Mottles are distinct or prominent. The B horizon is massive or has weak, granular structure.

The C horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 1 to 4. It is sandy loam or fine sandy loam or their gravelly analogues. Mottles are distinct or prominent and generally become less abundant with depth.

Limerick series

The Limerick series consists of coarse-silty, mixed, nonacid, mesic Typic Fluvaquents. These deep, poorly drained soils are on flood plains. The soils formed in alluvium derived mainly from mica schist. Slopes range from 0 to 3 percent. In this survey area the soils are a taxadjunct to the Limerick series because they have a B horizon with a matrix that has chroma of 3. The Limerick series is defined as not having a B horizon and as having chroma of 1 or 2 to a depth of at least 30 inches. These differences do not significantly affect the use and management of these soils.

Limerick soils formed in the same kind of material as well drained Hadley soils, very poorly drained Saco Variant soils, and moderately well drained Winooski soils. They are similar to Raynham and Rumney soils. Limerick soils formed in alluvial material and are less developed than the Raynham soils. Limerick soils have more silt and very fine sand than the Rumney soils.

Typical pedon of Limerick silt loam in an area of Limerick and Rumney soils, in the town of North Andover, in an idle field 1/4 mile east of the junction of Interstate 495 and Massachusetts Route 114:

A1—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam; light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; many fine roots; medium acid; clear smooth boundary.

B—9 to 13 inches; brown (10YR 4/3) silt loam; few fine faint yellowish brown (10YR 5/6) mottles; weak fine and medium granular structure; friable, slightly sticky; few very fine roots; medium acid; clear smooth boundary.

C1—13 to 25 inches; olive gray (5Y 5/2) silt loam; common fine and medium prominent yellowish brown (10YR 5/8) and dark brown (7.5YR 3/2) mottles; massive; firm, sticky; few fine roots; medium acid; abrupt wavy boundary.

IIC2g—25 to 28 inches; gray (5Y 5/1) very fine sandy loam; many medium prominent yellowish brown (10YR 5/4) mottles; massive; friable; medium acid; clear wavy boundary.

IIC3g—28 to 42 inches; gray (5Y 5/1) very fine sandy loam; many coarse prominent yellowish brown (10YR 5/4) and dark brown (7.5YR 3/2) mottles; massive; friable; medium acid; abrupt wavy boundary.

IIIC4g—42 to 48 inches; gray (5Y 5/1) medium and coarse sand; common coarse prominent yellowish brown (10YR 5/4) and dark brown (7.5YR 3/2) mottles; single grain; loose; medium acid; abrupt smooth boundary.

IVC5g—48 to 60 inches; gray (5Y 5/1) very fine sand; common medium prominent yellowish brown (10YR 5/4) and dark brown (7.5YR 3/2) mottles; massive; very friable; medium acid.

The texture to a depth of 40 inches is dominantly silt loam or very fine sandy loam. The texture ranges from silt loam to coarse sand below a depth of 40 inches. Coarse fragments of gravel make up 0 to 3 percent of the pedon. Reaction is strongly acid to neutral in the upper part of the solum and medium acid or neutral in the lower part.

The A horizon has hue of 10YR to 5Y, value of 3 or 4, and chroma of 2 or 3.

The C horizon has hue of 10YR to 5Y, value of 4 or 5, chroma of 1 or 2 and is distinctly or prominently mottled.

Maybid series

The Maybid series consists of fine, illitic, nonacid, mesic Typic Humaquepts. These deep, very poorly drained soils are on old lakebeds and outwash plains. The soils formed in silty and clayey, glacial lake or marine sediments. Slopes range from 0 to 3 percent.

Maybid soils formed in the same kind of material as moderately well drained Buxton soils, poorly drained Scantic soils, and well drained Suffield soils. They are similar to Birdsall and Whately Variant soils. Maybid soils have more clay than the Birdsall soils. They have more clay and less sand in the solum than the Whately Variant soils.

Typical pedon of Maybid silt loam, in the town of Amesbury, in a wooded area 100 yards east of Woodward Road, at the Massachusetts-New Hampshire state line:

A1—0 to 7 inches; very dark gray (10YR 3/1) silt loam; moderate fine and medium granular structure; friable, slightly sticky, nonplastic; many fine medium and coarse roots; medium acid; clear smooth boundary.

A2g—7 to 11 inches; gray (5Y 5/1) silty clay loam; moderate medium and coarse angular blocky structure; friable, sticky, slightly plastic; common fine medium and coarse roots; medium acid; clear wavy boundary.

B2g—11 to 19 inches; greenish gray (5GY 5/1) silty clay; few fine prominent brown (7.5YR 4/4) mottles; massive; firm, sticky, plastic; very few fine roots; neutral; gradual wavy boundary.

C1g—19 to 27 inches; greenish gray (5GY 5/1) silty clay; massive; firm, sticky, plastic; neutral; gradual wavy boundary.

C2g—27 to 60 inches; dark greenish gray (5GY 4/1) silty clay; massive; firm, sticky, plastic; neutral.

The thickness of the solum ranges from 18 to 30 inches. The soil is typically free of coarse fragments, but a few pebbles are in some pedons. The reaction of the A horizon is strongly acid or medium acid, the B horizon medium acid to neutral, and the C horizon slightly acid to neutral.

The A1 horizon has hue of 10YR to 5Y, value of 2 or 3, and chroma of 0 to 2. It is silt loam or silty clay loam and typically has a very high organic matter content. In some pedons the surface horizon is muck. The A2 horizon has hue of 5Y, 5GY, or 5BG; value of 4 to 6; and chroma of 0 to 2. In some pedons it is distinctly or prominently mottled. The horizon is silty clay loam or silty clay.

The B horizon has hue of 5Y or 5GY, value of 4 or 5, and chroma of 0 to 2. It ranges from silty clay loam to clay. Mottles are distinct or prominent. It has prismatic or blocky structure, or it is massive.

The C horizon has hue of 5Y, 5GY, 5G, or 5BG; value of 4 or 5; and chroma of 0 or 1. It is silty clay or clay.

Medisaprists

Medisaprists in this survey area are very poorly drained and consist of areas that have more than 16 inches of organic material above mineral soil material. The soils formed in vegetative debris that accumulated under water. They are in depressions and broad drainageways and are along the margins of large ponds and lakes. Slopes are less than 1 percent.

Medisaprists are closely associated with most of the mineral soils in the survey area. They are similar to Ipswich, Westbrook, and Whitman soils. Medisaprists formed in freshwater marshes, whereas Ipswich and Westbrook formed in saltwater marshes. Medisaprists formed in organic material, and Whitman soils formed in mineral material.

Medisaprists have an organic solum that ranges from 16 inches to more than 60 inches thick. Depth to mineral soil varies from 16 inches to more than 6 feet. Coarse fragments consisting of tree stumps, trunks, stems, and branches make up 0 to 30 percent of the soils. The soils are extremely acid to medium acid.

The surface tier ranges from black to very dark grayish brown hemic or sapric material, and the subsurface tier is black, very dark grayish brown or reddish brown to dark brown sapric material. Layers of hemic material less than 7 inches thick are in most pedons.

The bottom tiers are usually sapric material with layers of hemic material less than 10 inches thick.

The underlying mineral soil material is strongly gleyed outwash, glacial till, lacustrine, or marine sediments.

Melrose series

The Melrose series consists of coarse-loamy over clayey, mixed, mesic Typic Dystrochrepts. The soils are deep and well drained and are on glaciolacustrine plains and deltas. They formed in acid glaciolacustrine deposits overlain by sandy glacial outwash material derived from schist and gneiss. Slopes range from 3 to 8 percent. In this survey area the soils are a taxadjunct to the Melrose series because they have a thicker sandy subsoil than is defined for the series. This difference does not significantly affect the use and management of the soils.

Melrose soils formed in the same kind of material as moderately well drained Elmwood soils, poorly drained Swanton soils, and very poorly drained Whately Variant soils. They are similar to Agawam and Suffield soils. Melrose soils have more silt and clay and less sand in the substratum than the Agawam soils. They have more sand and less silt in the solum than the Suffield soils.

Typical pedon of Melrose fine sandy loam, 3 to 8 percent slopes, in the town of Amesbury, on a wooded knoll 400 feet west of Buttonwood Road:

A1—0 to 4 inches; dark brown (10YR 3/3) fine sandy loam; weak fine granular structure; friable; many fine, medium, and coarse roots; strongly acid; abrupt smooth boundary.

B21—4 to 20 inches; dark yellowish brown (10YR 4/4) to yellowish brown (10YR 5/6) sandy loam; weak fine granular structure; very friable; many fine, medium, and coarse roots; strongly acid; clear wavy boundary.

B22—20 to 32 inches; light olive brown (2.5Y 5/4) loamy sand; very weak fine granular structure; very friable; common to few fine and medium roots; strongly acid; abrupt wavy boundary.

IIC—32 to 60 inches; olive gray (5Y 5/2) silty clay; massive; firm, very sticky, very plastic; very few fine roots in upper 6 inches; medium acid.

The depth to the clayey substratum ranges from 18 to 40 inches. The soil is typically free of gravel, although there is some coarse material where this soil is adjacent to gravelly outwash deposits. Reaction in unlimed areas ranges from strongly acid to medium acid in the solum, and from strongly acid to neutral in the underlying fine-textured material.

The A horizon has hue of 10YR and value and chroma of 2 to 4. It ranges from very fine sandy loam to sandy loam.

The B21 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 or 6. It ranges from fine sandy loam to coarse sandy loam. The B22 horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 4 or 6. It ranges from fine sandy loam to loamy sand.

The IIC horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 1 to 3. It is silty clay or varved silt and clay. The IIC horizon is massive or has thick, platy structure. In some pedons there are a few clay films in pores and on some ped faces.

Merrimac series

The Merrimac series consists of sandy, mixed, mesic Typic Dystrochrepts. The soils are deep and somewhat excessively drained (fig. 14). Merrimac soils formed in acid glacial outwash material derived mainly from granite and gneiss. They are on outwash plains, terraces, kames, and eskers. Slopes range from 0 to 25 percent.

Merrimac soils formed in the same kind of material as very poorly drained Scarboro soils, moderately well drained Sudbury soils, and poorly drained Walpole soils. They are similar to Agawam and Hinckley soils. Merrimac soils have more gravel in the substratum than the Agawam soils. They have less sand and gravel in the solum than the Hinckley soils.

Typical pedon of Merrimac fine sandy loam, 0 to 3 percent slopes, in the town of Newbury, 300 yards south of the junction of Ocean Avenue and Water Street in the town of Newburyport:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak very fine to medium granular structure; very friable; common fine and medium roots; 5 percent fine gravel; strongly acid; abrupt smooth boundary.

B21—8 to 18 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak very fine to medium granular structure; very friable; few fine roots; 5 percent fine gravel; strongly acid; abrupt wavy boundary.

B22—18 to 26 inches; yellowish brown (10YR 5/6) sandy loam; weak fine and medium granular structure; very friable; 10 percent fine gravel; strongly acid; abrupt wavy boundary.

IIC—26 to 60 inches; light olive brown (2.5YR 5/4) gravelly sand consisting of stratified sand, gravel, and cobblestones; single grain; loose; 30 percent rounded gravel, 10 percent cobblestones; medium acid.

The solum thickness ranges from 18 to 28 inches and generally corresponds to the depth to stratified sand and gravel. The solum commonly is 5 to 15 percent coarse fragments, but some horizons range from 0 to 30 per-

Figure 14.—A deep cut in an area of Merrimac fine sandy loam shows a contrasting layer at a depth of about 26 inches.

cent. The content of coarse fragments in individual strata of the substratum ranges from 0 to 70 percent and consists of gravel and cobblestones. The total volume of coarse fragments in the particle-size control section is less than 35 percent. Less than 25 percent of the fragments are dark, fine-grained shale, slate, or phyllite. Reaction is extremely acid to medium acid.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. The A1 horizon in some pedons is slightly darker. The A horizon ranges from very fine sandy loam to sandy loam.

The upper part of the B horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 or 6. It ranges from very fine sandy loam to sandy loam. The lower part of the B horizon has hue of 7.5YR to 2.5Y and value and chroma of 4 to 6. It ranges from sandy loam to loamy sand and their gravelly analogues.

The IIC horizon has hue of 10YR, 2.5Y, or 5Y and ranges widely in value and chroma. The horizon consists of sand, gravel, and cobblestones with a weighted texture of gravelly sand or very gravelly sand.

Montauk series

The Montauk series consists of coarse-loamy, mixed, mesic Typic Fragiochrepts. These deep, well drained soils are on uplands. The soils formed in glacial till. Slopes range from 3 to 25 percent.

Montauk soils formed in the same kind of material as poorly drained Ridgebury soils and moderately well drained Scituate soils. They are similar to Canton and Paxton soils. Montauk soils have a fragipan, which the Canton soils do not have. They have more sand in the fragipan than the Paxton soils.

Typical pedon of Montauk fine sandy loam, 3 to 8 percent slopes, in the town of Andover, in a wooded area about 1/3 mile northwest of the junction of Cross Avenue and High Plain Road:

O1—1 inch to 0; loose leaves and twigs.

A1—0 to 2 inches; black (10YR 2/1) fine sandy loam; weak fine granular structure; very friable; many fine roots; 5 percent angular gravel 2 to 30 millimeters in diameter; very strongly acid; abrupt smooth boundary.

B21—2 to 6 inches; brown (7.5YR 4/4) fine sandy loam that grades with depth to dark yellowish brown (10YR 4/4); weak fine granular structure; very friable; many fine roots and common medium and coarse roots; 5 percent angular gravel 2 to 30 millimeters in diameter; very strongly acid; clear wavy boundary.

B22—6 to 21 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine granular structure; very friable; common fine medium and coarse roots; 10 percent angular gravel 2 to 76 millimeters in diameter, 5 percent angular cobblestones; very strongly acid; clear wavy boundary.

B23—21 to 30 inches; light yellowish brown (10YR 6/4) fine sandy loam; weak fine granular structure; friable; few fine roots; 15 percent angular gravel, 10 percent angular cobblestones, 5 percent stones; strongly acid; abrupt wavy boundary.

IICx—30 to 60 inches; light brownish gray (2.5Y 6/2) gravelly loamy sand; weak medium platy structure; very firm; 20 percent angular gravel, 5 percent angular cobblestones, 10 percent stones; strongly acid.

The solum thickness ranges from 20 to 36 inches and corresponds closely to the depth to the underlying coarse-textured glacial till. The rock fragment content ranges from 3 to 35 percent. Reaction in unlimed areas is extremely acid to medium acid.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 to 3. It is generally fine sandy loam but ranges from loam to very fine sandy loam. The structure is weak or moderate granular.

The upper part of the B horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 8. The lower part of the B horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 4 or 6. It is typically fine sandy loam, but some subhorizons are loam.

The IICx horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 2 or 3. It is dominantly loamy sand, loamy fine sand, loamy coarse sand, or gravelly analogues of these textures. Some pedons are coarse sandy loam in the upper part of the Cx horizon. The IICx horizon is massive or has weak, thin or medium, platy structure. The consistence is firm to very firm.

Ninigret series

The Ninigret series consists of coarse-loamy over sandy or sandy-skeletal, mixed, mesic Aquic Dystrochrepts. These deep, moderately well drained soils are on outwash plains. The soils formed in glacial outwash. Slopes range from 0 to 8 percent.

Ninigret soils formed in the same kind of material as well drained Agawam soils. They are similar to Amostown, Deerfield, and Sudbury soils. Ninigret soils have more sand in the substratum than the Amostown soils, have less sand in the solum than the Deerfield soils, and have less gravel in the substratum than the Sudbury soils.

Typical pedon of Ninigret fine sandy loam, 0 to 3 percent slopes, in the town of Newbury, in an idle field 100 feet north of Pine Island Road and 900 feet east of High Road:

Ap—0 to 9 inches; dark brown (10YR 3/3) fine sandy loam; weak fine and medium granular structure; very friable; many fine and medium roots; medium acid; abrupt smooth boundary.

B21—9 to 17 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak fine and medium granular structure; very friable; many fine roots; strongly acid; abrupt wavy boundary.

B22—17 to 23 inches; light olive brown (2.5Y 5/4) fine sandy loam; few fine faint light olive gray (5Y 6/2) and olive yellow (2.5Y 6/6) mottles; weak fine and medium granular structure; friable; common fine roots; strongly acid; abrupt wavy boundary.

IIC1—23 to 30 inches; olive (5Y 4/3) loamy sand; few fine faint light olive gray (5Y 6/2) and light olive brown (2.5Y 5/4) mottles; massive; very friable; strongly acid; abrupt wavy boundary.

IIC2—30 to 38 inches; olive (5Y 4/3) loamy fine sand; many medium prominent light olive gray (5Y 6/2) and strong brown (7.5YR 5/8) mottles; massive; very friable; strongly acid; abrupt wavy boundary.

IIC3—38 to 60 inches; light olive brown (2.5Y 5/4) stratified fine and medium sand; many medium prominent light brownish gray (2.5Y 6/2) and strong brown (7.5YR 5/8) mottles; single grain; loose; strongly acid.

The thickness of the solum ranges from 18 to 34 inches but is typically 20 to 30 inches. The content of coarse fragments is less than 10 percent, by volume, in the solum and less than 20 percent in the C horizon above a depth of 40 inches. There are gravelly layers below a depth of 40 inches in some pedons. The reaction in unlimed areas ranges from medium acid to very strongly acid.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4. In undisturbed areas there is an A1 horizon 2 to 4 inches thick that is 1 or 2 units darker in value or chroma or both. The A horizon is fine sandy loam or very fine sandy loam.

The B21 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 or 6. The B22 horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 to 6. The B22 horizon has mottles with chroma of 2 or less. The texture of the B22 horizon is fine sandy loam, sandy loam, or loamy fine sand.

The C horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 2 to 4. The C horizon has distinct or prominent mottles. It is loamy fine sand, loamy sand, fine sand, or medium sand.

Paxton series

The Paxton series consists of coarse-loamy, mixed, mesic Typic Fragiochrepts. These deep, well drained soils are on uplands. The soils formed in glacial till. Slopes range from 3 to 45 percent. In this survey area the soils are a taxadjunct to the Paxton series because they have clay films in the fragipan that are not in the defined range for the series. They also have a stronger grade of structure in the fragipan. These differences do not significantly affect the use and management of the soils.

Paxton soils formed in the same kind of material as poorly drained Ridgebury soils, very poorly drained Whitman soils, and moderately well drained Woodbridge soils. They are similar to Charlton and Montauk soils. Paxton soils have a fragipan, which the Charlton soils do not have. They have less sand in the fragipan than the Montauk soils.

Typical pedon of Paxton fine sandy loam, 8 to 15 percent slopes, in the town of Amesbury, in an idle field on the hillside 700 feet east of the junction of Martin Road and Massachusetts Route 110:

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; 10 percent gravel, 5 percent cobblestones; extremely acid; abrupt smooth boundary.

B21—6 to 15 inches; yellowish brown (10YR 5/6) fine sandy loam; weak fine granular structure; friable; common fine and medium roots; 10 percent gravel, 5 percent cobblestones; strongly acid; abrupt wavy boundary.

B22—15 to 21 inches; light olive brown (2.5Y 5/4) gravelly fine sandy loam; moderate fine and medium subangular blocky structure; firm; few fine and medium roots; 15 percent gravel, 10 percent cobblestones; strongly acid; clear wavy boundary.

Bx1—21 to 36 inches; olive brown (2.5Y 4/4) gravelly fine sandy loam; strong medium and thick platy structure; very firm; thin clay films in some pores and on some ped faces; 15 percent gravel, 10 percent cobblestones; strongly acid; gradual wavy boundary.

Bx2—36 to 60 inches; olive (5Y 4/3) gravelly fine sandy loam; strong thick platy structure; very firm; thin clay films in most pores and on some ped faces; white coating between peds when dry; 25 percent gravel, 10 percent cobblestones; medium acid.

The depth to the fragipan ranges from 18 to 32 inches. The rock fragment content ranges from 5 to 35 percent in the solum and 10 to 35 percent in the fragipan. Reaction is slightly acid to strongly acid.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4. The A1 horizon, where present, has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. The A horizon is fine sandy loam or loam or gravelly analogues of these textures.

The B horizon has hue of 7.5YR or 10YR, value of 5, and chroma of 6 or 8 in the upper part and hue of 10YR or 2.5Y, value of 5, and chroma of 4 or 6 in the lower part. The horizon is sandy loam, fine sandy loam, or loam or their gravelly analogues. The structure is granular, subangular blocky, or platy.

The fragipan has hue of 2.5Y and 5Y, value of 4 or 5, and chroma of 3 or 4. It is fine sandy loam, sandy loam, or the gravelly analogues of these textures. It has strong, thin to thick, platy structure. In some pedons it has a few yellowish brown mottles.

Pipestone series

The Pipestone series consists of sandy, mixed, mesic Entic Haplaquods. These deep, somewhat poorly drained soils are on glacial outwash plains. The soils formed in sandy glacial outwash. Slopes range from 0 to 3 percent. In this survey area the soils are a taxadjunct to the Pipestone series because the C horizon has a yellower hue than is defined in the range for the series. This difference does not significantly affect the use and management of the soils.

Pipestone soils formed in the same kind of material as moderately well drained Deerfield soils, very poorly drained Scarboro soils, and excessively drained Windsor soils. They are similar to Walpole and Wareham soils. Pipestone soils have a spodic horizon, which the Walpole and Wareham soils do not have.

Typical pedon of Pipestone loamy sand, in the town of Salisbury, in a wooded area 1,500 feet north of the junction of Main Street and the Interstate 95 connector road:

O1—4 to 3 inches; undecomposed leaves and twigs.

O2—3 inches to 0; reddish black (10YR 2/1) decomposed organic remains.

A1—0 to 4 inches; black (10YR 2/1) loamy sand; weak fine and medium granular structure; friable; many fine medium and coarse roots; less than 5 percent rounded coarse fragments 2 to 5 millimeters in diameter; extremely acid; abrupt smooth boundary.

A2—4 to 8 inches; gray (10YR 5/1) sand; single grain; loose; many fine medium and coarse roots; 5 percent rounded coarse fragments 2 to 5 millimeters in diameter; extremely acid; clear wavy boundary.

B21ir—8 to 15 inches; dark yellowish brown (10YR 4/4) loamy sand; streaks of very dark grayish brown (10YR 3/2); few medium faint strong brown (7.5YR 5/6) mottles; single grain; loose; many fine and medium roots; 5 percent rounded coarse fragments 2 to 5 millimeters in diameter; very strongly acid; clear wavy boundary.

B22ir—15 to 21 inches; olive brown (2.5Y 4/4) loamy sand; many fine and medium prominent gray (N 5/0) and dark reddish brown (5YR 3/4) mottles; single grain; loose; common fine and medium roots; common nodules 5 to 25 millimeters in diameter of weakly cemented material with a dark reddish brown (2.5YR 3/4) outer shell and a dark reddish brown (2.5YR 2/4) core; 10 percent rounded coarse fragments 2 to 20 millimeters in diameter; very strongly acid; clear wavy boundary.

IIB3ir—21 to 32 inches; light olive brown (2.5Y 5/4) medium sand; many coarse prominent yellowish red (5YR 4/6) mottles; single grain; loose; few fine roots; few nodules 5 to 25 millimeters in diameter of weakly cemented material with a very dusky red (2.5YR 2/2) center; 10 percent rounded coarse fragments 2 to 20 millimeters in diameter; very strongly acid; clear wavy boundary.

IIIC1—32 to 38 inches; olive gray (5Y 5/2) fine sand; many medium prominent dark reddish brown (5YR 3/4) mottles; massive; loose; few fine roots; 5 percent rounded coarse fragments 2 to 20 millimeters in diameter; strongly acid; clear wavy boundary.

IVC2—38 to 60 inches; gray (5Y 5/1) stratified fine and medium sand with lenses of very fine sand; many medium prominent strong brown (7.5YR 5/6) mottles; massive; loose; 5 percent rounded coarse fragments 2 to 50 millimeters in diameter; strongly acid.

The thickness of the solum ranges from 20 to 36 inches. Gravel is in some pedons but comprises less than 10 percent of the volume. Reaction in the upper part of the solum ranges from extremely acid to neutral. Reaction of the lower part of the solum and of the substratum ranges from strongly acid to neutral.

The A1 horizon has hue of 7.5YR to 10YR, value of 2 or 3, and chroma of 1 or 2. It is loamy sand, fine sand, or sand. Cultivated areas have an Ap horizon 6 to 8 inches thick that is very dark gray (10YR 3/1) loamy sand. The A2 horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 1 or 2. It is sand or loamy sand.

The upper part of the B horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. The lower part of the B horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 to 5. The B horizon is loamy sand, sand, or fine sand. Some pedons have varying amounts of cemented material consisting of nodules 5 to 25 millimeters in diameter.

The C horizon has hue of 5Y, value of 5 or 6, and chroma of 1 to 3 and is mottled. It is sand or fine sand.

Raynham series

The Raynham series consists of coarse-silty, mixed, nonacid, mesic Aeric Haplaquepts. These deep, poorly drained soils are on outwash plains and old lakebeds. The soils formed in lacustrine deposits. Slopes range from 0 to 3 percent. In this survey area the soils are a taxadjunct to the Raynham series because the B horizon has a matrix with chroma of 3 or 4 and does not have a dominant chroma of 2 within 20 inches, as is required for the series. The soils also have more sand in part of the substratum than is defined for the series. These differences do not significantly affect the use and management of the soils.

Raynham soils formed in the same kind of material as moderately well drained Belgrade soils, very poorly

drained Birdsall soils, and well drained Unadilla soils. They are similar to Scantic, Swanton, and Walpole Variant soils. Raynham soils have more sand throughout the profile than the Scantic soils, have more sand in the substratum than the Swanton soils, and have more very fine sand and silt in the solum and more sand in the substratum than the Walpole Variant soils.

Typical pedon of Raynham silt loam, in the town of Amesbury, in an abandoned hayfield 150 feet west of Buttonwood Road, 0.2 mile north of Pleasant Valley Road:

Ap1—0 to 4 inches; very dark grayish brown (10YR 3/2) silt loam; weak fine and medium granular structure; friable; many fine roots; strongly acid; clear smooth boundary.

Ap2—4 to 10 inches; very dark grayish brown (10YR 3/2) silt loam; few fine distinct yellowish red (5YR 4/6) mottles in old root channels; weak fine and medium granular structure; friable; common fine roots; strongly acid; abrupt smooth boundary.

B21—10 to 13 inches; light olive brown (2.5Y 5/4) very fine sandy loam; few distinct strong brown (7.5YR 5/6) mottles; weak fine and medium granular structure; friable; few fine roots; medium acid; clear wavy boundary.

B22—13 to 27 inches; olive (5Y 5/3) very fine sandy loam; many medium distinct strong brown (7.5YR 5/6) mottles; weak fine granular structure; friable; few fine roots; medium acid; clear wavy boundary.

C1—27 to 36 inches; olive gray (5Y 5/2) very fine sandy loam; few fine distinct dark reddish brown (5YR 3/4) mottles in old root channels; massive; friable; slightly acid; clear wavy boundary.

C2—36 to 47 inches; olive gray (5Y 5/2) to olive (5Y 5/3) loamy very fine sand; many medium distinct yellowish brown (10YR 5/6) and dark reddish brown (5YR 3/4) mottles; massive; friable; slightly acid; clear wavy boundary.

C3—47 to 60 inches; olive gray (5Y 5/2) to olive (5Y 5/3) very fine sandy loam; many medium distinct yellowish brown (10YR 5/6) and dark reddish brown (5YR 3/4) mottles; massive; very friable; neutral.

The thickness of the solum ranges from 16 to 37 inches. There are few or no coarse fragments within 40 inches of the surface. Some pedons have thin layers of sand or gravel below a depth of 40 inches. Reaction is strongly acid to neutral in the solum and slightly acid to mildly alkaline in the substratum.

The A horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 2 or 3. It is silt loam or very fine sandy loam. Structure is weak or moderate, fine or medium granular.

The B horizon mainly has hue of 10YR through 5Y, value of 4 or 5, and chroma of 2 to 4. The B horizon is very fine sandy loam or silt loam. It has few to common and distinct or prominent mottles.

The C horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 1 to 3. It is very fine sandy loam, silt loam, or loamy very fine sand. It has fine or medium and distinct or prominent mottles.

Ridgebury series

The Ridgebury series consists of coarse-loamy, mixed, mesic Aeric Fragiaquepts. These deep, poorly drained soils are on uplands. The soils formed in loamy glacial till. Slopes range from 0 to 8 percent.

Ridgebury soils formed in the same kind of material as well drained Paxton soils, very poorly drained Whitman soils, and moderately well drained Woodbridge soils. They are similar to Leicester soils. Ridgebury soils have a fragipan, which the Leicester soils do not have.

Typical pedon of Ridgebury fine sandy loam, 0 to 3 percent slopes, in the town of Boxford, in an idle field 225 yards west-southwest of the junction of Interstate 95 and Massachusetts Route 97:

Ap—0 to 9 inches; very dark brown (10YR 2/2) fine sandy loam; weak fine and medium granular structure; friable; many fine roots; less than 5 percent gravel, 10 percent cobblestones; very strongly acid; abrupt wavy boundary.

B2—9 to 18 inches; olive gray (5Y 5/2) fine sandy loam; common fine distinct gray (N 5/0) and strong brown (7.5YR 5/6) mottles; weak fine and medium subangular blocky structure; firm; few fine roots; 15 percent gravel, 3 percent cobblestones; strongly acid; clear wavy boundary.

C1x—18 to 30 inches; olive (5Y 5/3) fine sandy loam; many fine and medium prominent gray (N 5/0), strong brown (7.5YR 5/6), and dark reddish brown (5YR 3/3) mottles; strong very thick platy structure; extremely firm; 15 percent gravel, 3 percent cobblestones; strongly acid; clear wavy boundary.

C2x—30 to 60 inches; olive brown (2.5Y 4/4) fine sandy loam; many fine and medium prominent gray (N 5/0), strong brown (7.5YR 5/6), and very dusky red (2.5YR 2/2) mottles; massive; firm; 15 percent gravel, 3 percent cobblestones; strongly acid.

The depth to the fragipan is commonly about 18 inches but ranges from 14 to 25 inches. Rock fragments make up 5 to 35 percent of the profile and are dominantly angular pebbles and stones of gneiss, granite, and schist. Reaction in unlimed areas is very strongly acid or strongly acid in the solum and strongly acid to medium acid in the substratum.

The Ap horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 2. It is sandy loam, fine sandy loam, loam, or the gravelly analogues of these textures.

The B horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 0 to 3. It is loam, sandy loam, fine sandy loam, or gravelly analogues of these textures. Mottles are few or common and distinct or prominent. The B horizon is massive or has subangular blocky or thin platy structure. Consistence is friable or firm.

The Cx horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 2 to 4. Mottles in the Cx horizon are common or many and distinct or prominent. The Cx horizon is typically fine sandy loam or sandy loam but ranges from coarse sandy loam to loam and includes the gravelly analogues of these textures. The horizon has medium to very thick platy structure, or it is massive. Consistence is firm to extremely firm.

Rumney series

The Rumney series consists of coarse-loamy, mixed, nonacid, mesic Aeric Fluvaquents. The soils are deep and poorly drained. They formed in recent alluvium on flood plains. Slopes range from 0 to 3 percent.

Rumney soils are similar to Limerick and Walpole soils. Rumney soils have more medium and coarse sand and less silt and very fine sand than the Limerick soils. They formed in alluvial material and are less developed than the Walpole soils.

Typical pedon of Rumney fine sandy loam, in an area of Limerick and Rumney soils, in the town of Topsfield, in a wooded area off Perkins Row about 2,400 feet east-southeast of Stewart School:

O1—2 inches to 0; black (10YR 2/1) organic material.
A1—0 to 5 inches; very dark brown (10YR 2/2) fine sandy loam; weak fine granular structure; very friable; many fine medium and coarse roots; strongly acid; abrupt smooth boundary.
B21g—5 to 14 inches; olive gray (5Y 5/2) fine sandy loam; common fine prominent gray (5Y 5/1) and yellowish brown (10YR 5/6) mottles; weak fine granular structure; very friable; common fine and medium roots; strongly acid; clear wavy boundary.
B22g—14 to 29 inches; dark grayish brown (2.5Y 4/2) fine sandy loam; many fine and medium prominent gray (5Y 5/1), strong brown (7.5YR 5/6), and reddish brown (5YR 4/4) mottles; weak fine granular structure; very friable; few fine roots; strongly acid; abrupt wavy boundary.
IIC—29 to 60 inches; olive gray (5Y 5/2) stratified loamy sand, sand, and gravelly sand; common fine and medium prominent gray (5Y 5/1), yellowish brown (10YR 5/6), brown (7.5YR 4/4), and reddish brown (5YR 4/4) mottles; single grain; loose; 10 percent gravel; medium acid.

The thickness of the solum ranges from 20 to 36 inches and generally corresponds to the depth to the contrasting material. The content of gravel-size coarse fragments ranges from 0 to 10 percent in the solum and from 5 to 40 percent in the IIC horizon. Reaction ranges from very strongly acid to slightly acid.

The A horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 or 2. It is fine sandy loam, sandy loam, or loam. Structure is weak or moderate, fine or medium granular. Consistence is friable or very friable.

The B horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 1 or 2. At least one mottled subhorizon has hue of 2.5Y, value of 4 or 5, and chroma of 2. The B horizon is fine sandy loam, sandy loam, or loam. Structure is weak or moderate, fine granular. Consistence is friable or very friable.

The IIC horizon has hue of 2.5Y or 5Y, value of 3 to 6, and chroma of 1 or 2 and is mottled. It is dominantly loamy sand or gravelly sand, but some pedons have strata less than 5 inches thick of coarse sand, sand, fine sand, very fine sand, silt, or organic material.

Saco Variant

The Saco Variant consists of coarse-silty over sandy or sandy-skeletal, mixed, nonacid, mesic Typic Fluvaquents. These deep, very poorly drained soils are on flood plains. The soils formed in silty and fine sandy alluvium. Slopes are less than 1 percent.

Saco Variant soils formed in the same kind of material as well drained Hadley soils, poorly drained Limerick soils, and moderately well drained Winooski soils. They are similar to Birdsall and Scarboro soils. Saco Variant soils have more sand and less silt in the substratum than the Birdsall soils. They have less organic matter in the surface layer than the Scarboro soils.

Typical pedon of Saco Variant silt loam, in the town of Boxford, in a wooded area 1,300 feet south-southeast of the junction of Interstate Route 95 and Endicott Road:

O1—1 inch to 0; undecomposed organic remains of twigs, grasses, and roots.
A1—0 to 5 inches; very dark gray (10YR 3/1) silt loam; weak fine and medium granular structure; friable; many fine and medium roots; very strongly acid; abrupt smooth boundary.
C1g—5 to 20 inches; gray (5Y 5/1) silt loam; few fine distinct dark yellowish brown (10YR 4/4) mottles; massive; friable, slightly sticky; few fine roots; medium acid; abrupt smooth boundary.
IIC2g—20 to 30 inches; dark gray (5Y 4/1) loamy fine sand; single grain; loose; medium acid; abrupt smooth boundary.
IIC3g—30 to 38 inches; gray (5Y 5/1) fine sand; massive; very friable; few thin layers of very dark grayish brown (10YR 3/2) muck; slightly acid; abrupt smooth boundary.
IIC4g—38 to 60 inches; gray (5Y 5/1) sand; massive; very friable; few thin layers of very dark grayish brown (10YR 3/2) muck; slightly acid.

The depth to sand or sand and gravel ranges from 18 to 40 inches. The coarse fragment content above a depth of 40 inches is less than 5 percent, and in individual strata below a depth of 40 inches is 0 to 50 percent. Reaction ranges from very strongly acid to medium acid above a depth of 30 inches and medium acid or slightly acid below a depth of 30 inches.

The A1 horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 2. It is silt loam, mucky silt loam, or very fine sandy loam.

The thickness and number of horizons below the A1 horizon are extremely variable. The texture of the upper layers is silt loam or very fine sandy loam. Lower layers are fine sand, sand, loamy fine sand, or their gravelly analogues. Matrix colors in the C horizon have hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 0 or 1. Structure is weak granular, or the horizon is massive or single grain. Consistence is friable, very friable, or loose.

Scantic series

The Scantic series consists of fine, illitic, nonacid, mesic Typic Haplaquepts. These deep, poorly drained soils are on lakebeds, outwash plains, and terraces. The soils formed in lacustrine or marine sediments. Slopes range from 0 to 8 percent.

Scantic soils formed in the same kind of material as moderately well drained Buxton soils, very poorly drained Maybid soils, and well drained Suffield soils. They are similar to Raynham and Swanton soils. Scantic soils have less sand and more silt and clay throughout the profile than the Raynham soils. They have less sand and more silt in the solum than the Swanton soils.

Typical pedon of Scantic silt loam, 0 to 3 percent slopes, in the town of Newbury, in a cultivated field 150 feet south of Orchard Street, 2,600 feet west from its intersection with Middle Street:

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; moderate fine granular structure; friable; many fine roots; slightly acid; abrupt smooth boundary.

A2g—6 to 11 inches; grayish brown (2.5Y 5/2) silt loam; common medium distinct light yellowish brown (2.5Y 6/4) and olive brown (2.5Y 4/4) mottles; moderate fine and medium granular structure; friable, slightly sticky; common fine roots; medium acid; abrupt smooth boundary.

B21g—11 to 14 inches; light gray (5Y 6/1) silt loam; common medium distinct light yellowish brown (2.5Y 6/4) and olive brown (2.5Y 4/4) mottles; moderate fine and medium blocky structure parting to moderate fine and medium granular; firm, slightly sticky; few fine roots; medium acid; gradual smooth boundary.

B22g—14 to 18 inches; light gray (5Y 6/1) silty clay loam; few medium prominent strong brown (7.5YR 5/6) mottles and common medium distinct olive brown (2.5Y 4/4) mottles; moderate fine and medium blocky structure; firm, sticky; medium acid; gradual smooth boundary.

B3g—18 to 26 inches; gray (5Y 5/1) silty clay loam; few fine prominent strong brown (7.5YR 5/6) mottles and common medium distinct olive brown (2.5Y 4/4) mottles; moderate medium platy structure; firm, sticky; slightly acid; clear smooth boundary.

C1g—26 to 33 inches; gray (5Y 5/1) clay; many medium distinct and prominent yellowish brown (10YR 5/6) and olive (5Y 5/6) mottles; moderate medium platy structure; very firm; very sticky; slightly acid; clear smooth boundary.

C2g—33 to 60 inches; gray (5Y 5/1) clay; many medium distinct and prominent olive (5Y 5/6) and yellowish brown (10YR 5/6) mottles that are less abundant and less prominent with depth; moderate medium platy structure; very firm, very sticky; slighty acid.

The thickness of the solum ranges from 25 to 36 inches. The soil is typically free of coarse fragments, but there are a few granite or quartzite pebbles in some pedons. In unlimed areas reaction in the upper part of the solum is strongly acid or medium acid and in the lower part of the solum and in the C horizon is medium acid to neutral.

The Ap horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 or 2. It is silt loam, loam, or silty clay loam. The A2g horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 1 or 2 and has few or common mottles. It is silt loam or loam.

The B horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 1 or 2. Mottles are fine or medium and distinct or prominent. The horizon is silt loam or silty clay loam in the upper part and silty clay loam, silty clay, or clay in the lower part. Consistence is friable or firm.

The C horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 1 or 2. The mottles are less abundant than in the B horizon or are absent. The horizon is silty clay loam, silty clay, or clay. Platy structure is typical, but some pedons have very coarse prismatic structure. Consistence is firm or very firm.

Scarboro series

The Scarboro series consists of sandy, mixed, mesic Histic Humaquepts. These deep, very poorly drained soils are on outwash plains and terraces. The soils formed in sandy outwash deposits derived mainly from gneiss and granite. Slopes range from 0 to 3 percent.

Scarboro soils formed in the same kind of material as moderately well drained Deerfield soils, poorly drained Wareham soils, and excessively drained Windsor soils. They are similar to Saco Variant soils but have more organic matter in the surface layer.

Typical pedon of Scarboro mucky fine sandy loam, in the town of Rowley, in a wooded area 200 yards south of the junction of Bradford Street and Haverhill Street:

O1—6 to 4 inches; dark reddish gray (5YR 4/2) and pinkish gray (5YR 6/2) organic mat that turns pinkish white (5YR 8/2) when squeezed; 90 percent organic material (sphagnum moss, roots, and decaying leaves); many fine roots.

O2—4 inches to 0; black (N 2/0) muck; massive; very friable, nonsticky; many fine and medium roots; very strongly acid; abrupt wavy boundary.

A1—0 to 5 inches; very dark gray (10YR 3/1) mucky fine sandy loam with streaks of black (N 2/0); massive; very friable, nonsticky; many fine and medium roots; very strongly acid; abrupt smooth boundary.

A2g—5 to 16 inches; gray (5Y 5/1) loamy sand; 50 percent dark reddish brown (5YR 3/2) streaks in old root channels; massive; very friable; common fine roots; very strongly acid; gradual wavy boundary.

C1g—16 to 26 inches; gray (5Y 5/1) loamy sand; 10 percent dark reddish brown (5YR 3/2) and lighter streaks in old root channels; massive; very friable; few fine roots; medium acid; gradual wavy boundary.

C2g—26 to 60 inches; light gray (5Y 6/1) fine sand; massive; very friable; medium acid.

The content of coarse fragments in the particle-size control section ranges from 0 to 10 percent. Below a depth of 30 inches, individual strata are up to 50 percent fine gravel. Reaction ranges from very strongly acid to medium acid.

The O horizon consists of muck or mucky peat.

The A1 horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 0 to 2. It is fine sandy loam, sandy loam, loamy fine sand, or loamy sand and their mucky analogues. The A2 horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 0 or 1 and has little or no mottling. It ranges from loamy fine sand to sand.

The C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 0 or 1. It is loamy sand, fine sand, or sand and is generally stratified.

Scituate series

The Scituate series consists of coarse-loamy, mixed, mesic Typic Fragiochrepts. These deep, moderately well drained soils are on uplands. The soils formed in compact acid glacial till derived mainly from gneiss and granite. Slopes range from 3 to 15 percent.

Scituate soils formed in the same kind of material as the well drained Montauk soils. They are similar to Sutton and Woodbridge soils. Scituate soils have a fragipan, which the Sutton soils do not have. They also have more sand in the substratum than the Sutton or Woodbridge soils.

Typical pedon of Scituate fine sandy loam, 8 to 15 percent slopes, in the town of North Andover, in a wooded area that was once cultivated, 1,400 feet west-northwest of the junction of Marbleridge Road and Johnson Street:

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) fine sandy loam, light brownish gray (10YR 6/2) dry; weak fine and medium granular structure; very friable; many fine to coarse roots; 10 percent angular gravel; very strongly acid; clear smooth boundary.

B21—10 to 16 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine and medium granular structure; very friable; many fine to coarse roots; 10 percent angular gravel; very strongly acid; clear wavy boundary.

B22—16 to 27 inches; light olive brown (2.5Y 5/4) fine sandy loam; few fine faint yellowish brown (10YR 5/6) mottles; very weak fine granular structure; friable; common fine and medium roots; 10 percent angular gravel; very strongly acid; clear wavy boundary.

IIC1x—27 to 32 inches; olive gray (5Y 5/2) gravelly loamy sand; few fine distinct yellowish brown (10YR 5/6) mottles; weak medium and thick platy structure; firm, brittle; few fine roots; 20 percent angular gravel; strongly acid; clear wavy boundary.

IIC2x—32 to 60 inches; olive gray (5Y 5/2) loamy sand; common fine and medium prominent gray (5Y 6/1), yellowish brown (10YR 5/6), and reddish brown (5YR 4/3) mottles; moderate to strong medium and thick platy structure; firm; 15 percent angular gravel; strongly acid.

The solum ranges from 18 to 30 inches in thickness, and its depth closely corresponds to the depth to the fragipan. The depth to mottling ranges from 14 to 30 inches. The amount of coarse fragments ranges from 5 to 20 percent in the solum and from 15 to 50 percent in the IIC horizon. Reaction ranges from very strongly acid to medium acid in unlimed areas.

The Ap horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It ranges from fine sandy loam to loam.

The B21 horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 4 or 6. The B22 horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 4 or 6. The B horizon is fine sandy loam, sandy loam, or loam.

The IICx horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 2 to 4. The horizon is loamy fine sand, loamy sand, or loamy coarse sand and their gravelly analogues. The IICx horizon is massive or has platy structure. Mottles are distinct or prominent.

Sudbury series

The Sudbury series consists of sandy, mixed, mesic Aquic Dystrochrepts. These deep, moderately well drained soils are on terraces and outwash plains. The soils formed in acid glacial outwash derived mainly from gneiss and granite. Slopes range from 0 to 8 percent.

Sudbury soils formed in the same kind of material as somewhat excessively drained Merrimac soils, very poorly drained Scarboro soils, and poorly drained Walpole soils. They are similar to the Deerfield and Ninigret soils. Sudbury soils have less sand in the solum than the Deerfield soils. They have more gravel in the substratum than the Deerfield or Ninigret soils.

Typical pedon of Sudbury fine sandy loam, 3 to 8 percent slopes, in the town of Andover, in a wooded area about 700 feet east of the junction of Chandler Road and North Street:

O1—3 to 1 inches; undecomposed leaves and twigs.
O2—1 inch to 0; black (5Y 2/2) decomposed organic material.
A1—0 to 4 inches; very dark brown (10YR 2/2) fine sandy loam; weak fine and medium granular structure; very friable; many fine medium and coarse roots; less than 5 percent fine gravel; very strongly acid; abrupt smooth boundary.
B21—4 to 8 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak fine and medium granular structure; very friable; many fine and medium roots; 5 percent rounded gravel 2 to 40 millimeters in diameter; medium acid; abrupt wavy boundary.
B22—8 to 20 inches; yellowish brown (10YR 5/4) sandy loam; weak fine and medium granular structure; very friable; common fine and medium roots; 10 percent rounded gravel 2 to 25 millimeters in diameter; medium acid; clear wavy boundary.
B23—20 to 26 inches; yellowish brown (10YR 5/6) loamy sand; few medium distinct light brownish gray (2.5Y 6/2) and reddish brown (5YR 4/4) mottles; single grain; loose; few fine and medium roots; 15 percent rounded gravel 2 to 30 millimeters in diameter; medium acid; abrupt wavy boundary.
IIC—26 to 60 inches; yellowish brown (10YR 5/4) stratified sand and gravel; common medium prominent light brownish gray (2.5Y 6/2) and reddish brown (5YR 4/4) mottles; single grain; loose; few fine roots in upper part; strata vary from 10 percent fine gravel to 40 percent rounded coarse fragments (30 percent gravel, 10 percent cobblestones); medium acid.

The thickness of the solum ranges from 18 to 30 inches, and its depth corresponds to the depth to the stratified sand and gravel. The depth to mottles ranges from 12 to 24 inches. The rock fragment content of the solum ranges from 0 to 30 percent. The fragments are mainly gravel less than 1 inch in diameter. The rock fragment content of the C horizon ranges from 25 to 70 percent, of which 20 to 65 percent is gravel and 5 to 25 percent is cobblestones and stones. Less than 25 percent of the fragments are dark, fine-grained shale, slate, or phyllite. Reaction in unlimed areas ranges from extremely acid to medium acid throughout the soil.

The A1 horizon has hue of 7.5YR or 10YR and value and chroma of 2 or 3; the Ap horizon, where present, has value and chroma 1 unit higher. The A horizon is fine sandy loam, sandy loam, or very fine sandy loam.

The B horizon has hue of 7.5YR and 10YR, value of 4 or 5, and chroma of 4 to 8. The texture in the upper part of the horizon is fine sandy loam or sandy loam and in the lower part sandy loam to coarse sand.

The IIC horizon has hue of 10YR to 5Y, value of 5, and chroma of 2 to 4. It consists of stratified sand, gravel, and cobblestones and ranges from gravelly sand to very gravelly coarse sand.

Suffield series

The Suffield series consists of coarse-silty over clayey, mixed, mesic Dystric Eutrochrepts. The soils are deep and well drained. They formed in silty and clayey glacial lake sediments and are on old lakebeds. Slopes range from 3 to 15 percent.

Suffield soils formed in the same kind of material as moderately well drained Buxton soils, very poorly drained Maybid soils, and poorly drained Scantic soils. They are similar to Hadley, Melrose, and Unadilla soils. Suffield soils have more silt and less sand throughout the profile than the Hadley or Unadilla soils. They have more silt and less sand in the solum than the Melrose soils.

Typical pedon of Suffield silt loam, 8 to 15 percent slopes, in the town of Newbury, adjacent to a pit west of Old Rowley Road, 2,800 feet west-southwest of its junction with High Road:

Ap—0 to 7 inches; dark brown (10YR 3/3) silt loam; weak and moderate fine and medium granular structure; friable; many fine roots; strongly acid; abrupt smooth boundary.
B21—7 to 12 inches; light olive brown (2.5Y 5/4) silt loam; moderate thin platy structure parting to moderate fine granular; friable; common fine roots; strongly acid; abrupt wavy boundary.
B22—12 to 24 inches; light olive brown (2.5Y 5/4) silt loam; moderate fine and medium blocky structure; firm; thin clay films in pores; common fine roots; many fine pores; medium acid; clear wavy boundary.
B23—24 to 35 inches; light olive brown (2.5Y 5/4) silt loam; strong coarse blocky structure; very firm, nonsticky, slightly plastic; thin clay films in pores; few fine roots; many fine pores; medium acid; clear wavy boundary.
IIC—35 to 60 inches; light brownish gray (2.5Y 6/2) and olive brown (2.5Y 4/4) ped faces; light olive brown

(2.5Y 5/4) ped interior; varved silt and clay with very thin strata of very fine sand between varves; overall texture of silty clay; strong coarse and very coarse prismatic structure; very firm, sticky, plastic; clay films on prism faces and in pores; slightly acid.

The thickness of the silty layer over the contrasting clayey material is 18 to 40 inches. The profile is typically free of coarse fragments, but some pedons contain a few granite or quartzite pebbles. Reaction in the upper part of the solum ranges from strongly acid to slightly acid. In some places the surface layer is neutral if heavily limed. The lower part of the solum and the substratum are medium acid to neutral.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3.

The B21 horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 4 to 6. The B22 and B23 horizons have hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 2 to 4. Clay films are common in some pores. Some ped faces have patchy clay films on the top and on vertical faces.

The IIC horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 2 to 4. It is silty clay loam or silty clay. In the upper part of this horizon, clay flows are common in pores and on ped faces. Patchy or discontinuous black coatings are common on the ped faces.

Sutton series

The Sutton series consists of coarse-loamy, mixed, mesic Aquic Dystrochrepts. These deep, moderately well drained soils are on uplands. The soils formed in glacial till. Slopes range from 0 to 15 percent.

Sutton soils formed in the same kind of material as well drained Charlton soils, poorly drained Leicester soils, and very poorly drained Whitman soils. They are similar to the Scituate and Woodbridge soils. Sutton soils do not have a fragipan, which the Scituate and Woodbridge soils have. They have less sand in the substratum than the Scituate soils.

Typical pedon of Sutton fine sandy loam, 3 to 8 percent slopes, in the town of Boxford, 600 feet west of the junction of Interstate Route 95 and Massachusetts Route 97:

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; friable; many fine roots; 10 percent angular gravel, 5 percent angular cobblestones; strongly acid; abrupt smooth boundary.

B21—9 to 22 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine granular structure; friable; common fine roots; 10 percent angular gravel, 5 percent angular cobblestones; very strongly acid; clear smooth boundary.

B22—22 to 26 inches; light olive brown (2.5Y 5/4) gravelly fine sandy loam; few fine faint grayish brown (2.5Y 5/2) mottles; and few fine distinct yellowish brown (10YR 5/6) mottles; weak fine granular structure; friable; 15 percent angular gravel, 10 percent angular cobblestones; very strongly acid; clear wavy boundary.

C1—26 to 31 inches; light olive brown (2.5Y 5/4) gravelly fine sandy loam; common fine and medium distinct gray (N 5/0) and strong brown (7.5YR 5/6) mottles; massive; friable; 25 percent angular gravel, 10 percent angular cobblestones; very strongly acid; abrupt wavy boundary.

C2—31 to 60 inches; light olive gray (5Y 6/2) gravelly fine sandy loam; many fine and medium prominent light gray (N 7/0), yellowish brown (10YR 5/6), dark reddish brown (5YR 3/4), and yellowish red (5YR 5/8) mottles; massive; friable; 10 percent angular gravel, 10 percent angular cobblestones; very strongly acid.

The thickness of the solum ranges from 20 to 30 inches. The depth to mottling ranges from 16 to 24 inches. Gravel-size coarse fragments make up 5 to 25 percent of the solum. Reaction in unlimed areas is very strongly acid to medium acid.

The A horizon has hue of 7.5YR or 10YR and value and chroma of 2 to 4. It is fine sandy loam, very fine sandy loam, or loam.

The B21 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. It is fine sandy loam, sandy loam, or loam. The B22 horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 4 to 6 and is distinctly or prominently mottled. It is fine sandy loam or sandy loam.

The C horizon has hue of 2.5Y or 5Y, value of 5 or 6, and chroma of 2 to 4. It is fine sandy loam, sandy loam, or gravelly analogues of these textures. The consistence in the C horizon ranges from friable to firm. The horizon is massive or has platy structure.

Swanton series

The Swanton series consists of coarse-loamy over clayey, mixed, nonacid mesic Aeric Haplaquepts. These deep, poorly drained soils are on lacustrine and marine plains. The soils formed in glacial outwash over lacustrine or marine sediments. Slopes range from 0 to 8 percent.

Swanton soils formed in the same kind of material as moderately well drained Elmwood soils, well drained Melrose soils, and very poorly drained Whately Variant soils. They are similar to Raynham, Scantic, and Walpole Variant soils. Swanton soils have more clay in the substratum than the Raynham soils, have more sand and less silt in the solum than the Scantic soils, and have a substratum that has more clay and less stratification than that in the Walpole Variant soils.

Typical pedon of Swanton fine sandy loam, 0 to 3 percent slopes, in the town of Salisbury, in a wooded area off Ferry Road, 50 yards north of the radio station antenna:

O1—2 inches to 1 inch; undecomposed deciduous leaves and twigs.
O2—1 inch to 0; partly decomposed leaves and twigs.
Ap1—0 to 2 inches; very dark brown (10YR 2/2) fine sandy loam; weak fine granular structure; very friable; many fine medium and coarse roots; medium acid; abrupt irregular boundary.
Ap2—2 to 8 inches; very dark grayish brown (10YR 3/2) fine sandy loam; few fine faint strong brown (7.5YR 5/6) mottles; weak fine granular structure; very friable; common fine and medium roots; strongly acid; abrupt smooth boundary.
B21g—8 to 19 inches; olive (5Y 5/3) fine sandy loam; many medium prominent gray (5Y 6/1) and yellowish red (5YR 5/8) mottles; weak fine granular structure; friable; common fine roots; strongly acid; clear wavy boundary.
B22g—19 to 28 inches; olive gray (5Y 4/2) fine sandy loam; common fine prominent gray (5Y 6/1) and yellowish red (5YR 5/8) mottles; moderate thick platy structure; firm; medium acid; clear wavy boundary.
IIC1—28 to 38 inches; mottled olive (5Y 4/3) silty clay loam; many medium distinct yellowish red (5YR 5/6) mottles; massive; firm; thin clay films in some pores; medium acid; clear wavy boundary.
IIC2—38 to 60 inches; olive (5Y 4/3) silty clay; common fine prominent light gray (5Y 6/1), yellowish red (5YR 5/6), and dark reddish brown (2.5YR 2/4) mottles; weak very thick platy structure controlled by varved sediments; very firm; slightly acid.

The thickness of the coarse-loamy mantle ranges from 18 to 40 inches. The solum is generally free of coarse fragments. Reaction in the solum ranges from strongly acid to medium acid and in the substratum from medium acid to neutral.

The A horizon has hue of 7.5YR to 2.5Y, value of 2 or 3, and chroma of 1 or 2. It is typically fine sandy loam but ranges from sandy loam to very fine sandy loam.

The B horizon has hue of 2.5Y or 5Y, value of 3 to 5, chroma of 1 to 3 and is distinctly or prominently mottled. It is generally fine sandy loam but ranges from sandy loam to very fine sandy loam.

Some pedons have a IIB horizon that has hue of 2.5Y or 5Y, value of 5 or 6, chroma of 2 or 3 and is mottled. The horizon ranges from silty clay loam to clay.

The IIC horizon has hue of 5Y, value of 4 or 5, and chroma of 1 to 3. It ranges from silty clay loam to clay and is varved in some pedons.

Udipsamments

Udipsamments consist of deep, excessively drained soils with light gray, grayish brown, and gray medium sand. The soils formed in wind-deposited sand from the nearby coastal beaches. Udipsamments are on sand dunes subject to wind-controlled deflation and deposition. Slopes range from 3 percent to more than 50 percent.

Udipsamments are similar to Windsor soils but are stratified and grayer than the Windsor soils.

Udorthents

Udorthents consist of areas from which soil material has been excavated and of nearby areas where the material has been deposited. This material ranges from a mixture of sand and gravel to silty loam. Slopes range from 0 to 25 percent.

Udorthents are associated with many different soils and with Urban land but do not have the structures that are characteristic of Urban land.

Unadilla series

The Unadilla series consists of coarse-silty, mixed, mesic Typic Dystrochrepts. These deep, well drained soils are on old lakebeds. The soils formed in glaciolacustrine deposits. Slopes range from 0 to 15 percent.

Unadilla soils formed in the same kind of material as moderately well drained Belgrade soils, very poorly drained Birdsall soils, and poorly drained Raynham soils. They are similar to Agawam, Hadley, and Suffield soils. Unadilla soils have more very fine sand and less fine sand than the Agawam soils; are more developed than the Hadley soils, which formed in recent alluvium; and have more sand and less silt throughout the profile than the Suffield soils.

Typical pedon of Unadilla very fine sandy loam, 3 to 8 percent slopes, in the town of Rowley, in a wooded area that was once cultivated, 800 feet northeast of the junction of Stackyard Road and Far Patmos Road:

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) very fine sandy loam; weak fine and very fine granular structure; very friable; many fine medium and coarse roots; very strongly acid; abrupt smooth boundary.
B21—9 to 17 inches; yellowish brown (10YR 5/4) very fine sandy loam; weak fine and very fine subangular blocky structure; very friable; many fine medium and coarse roots; strongly acid; clear wavy boundary.
B22—17 to 29 inches; light olive brown (2.5Y 5/4) very fine sandy loam; massive; very friable; common fine and medium roots; strongly acid; clear wavy boundary.

C1—29 to 53 inches; light olive brown (2.5Y 5/4) very fine sandy loam; massive; very friable; few fine roots; strongly acid; clear wavy boundary.
C2—53 to 60 inches; olive (5Y 5/3) loamy very fine sand; massive; very friable; strongly acid.

The thickness of the solum ranges from 20 to 33 inches. The depth to contrasting soil material is more than 40 inches. Coarse fragments make up 0 to less than 5 percent of the profile.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. It is very fine sandy loam or silt loam. Reaction ranges from very strongly acid to medium acid.

The B21 horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 4 to 6. The B22 horizon has hue of 10YR to 2.5Y and value and chroma of 4 to 6. It is very fine sandy loam or silt loam. Reaction ranges from very strongly acid to medium acid.

The C horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 2 to 4. The horizon is very fine sandy loam above a depth of 40 inches and very fine sand to silt loam below a depth of 40 inches. Reaction ranges from strongly acid to medium acid.

Walpole series

The Walpole series consists of sandy, mixed, mesic Aeric Haplaquepts. These deep, poorly drained soils are on outwash plains and terraces. The soils formed in sandy and gravelly glacial outwash material. Slopes range from 0 to 8 percent.

Walpole soils formed in the same kind of material as somewhat excessively drained Merrimac soils, very poorly drained Scarboro soils, and moderately well drained Sudbury soils. They are similar to the Pipestone, Walpole Variant, and Wareham soils. Walpole soils do not have a spodic horizon, which the Pipestone soils have. Walpole soils have more sand throughout the profile than the Walpole Variant soils. They have less sand in the solum and are more developed than the Wareham soils.

Typical pedon of Walpole fine sandy loam, 0 to 3 percent slopes, in the town of Topsfield, in a hayfield 700 feet west of the junction of Salem Road and Rowley Hill Street:

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; friable; many fine roots; slightly acid; abrupt smooth boundary.
B2—10 to 24 inches; grayish brown (2.5Y 5/2) sandy loam; few fine distinct yellowish brown (10YR 5/6) mottles; weak fine granular structure; friable; few fine roots; 5 percent fine gravel; medium acid; abrupt wavy boundary.
IIC1—24 to 30 inches; olive (5Y 5/3) gravelly loamy sand; common fine distinct brown (7.5YR 4/4) mottles; single grain; very friable; 20 percent fine gravel; medium acid; clear wavy boundary.
IIC2—30 to 36 inches; grayish brown (2.5Y 5/2) loamy sand; common medium faint light brownish gray (2.5Y 6/2) mottles and common medium distinct yellowish brown (10YR 5/6) mottles; single grain; very friable; medium acid; abrupt wavy boundary.
IIC3—36 to 60 inches; olive brown (2.5Y 4/4) stratified sand, gravel, and gravelly sand; many medium prominent gray (10YR 6/1) and brown (7.5YR 4/4) mottles; single grain; loose; 0 to 40 percent fine gravel in individual strata; 20 percent black (10YR 2/1) minerals; medium acid.

The thickness of the solum ranges from 18 to 25 inches. The amount of coarse fragments in the soil generally ranges from 0 to 25 percent; some strata in the C horizon contain up to 40 percent. Reaction in unlimed areas is strongly acid to medium acid.

The Ap horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It is fine sandy loam or sandy loam.

The B2 horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 3. It is fine sandy loam or sandy loam.

The C horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 2 to 4. It is loamy sand, gravelly loamy sand, sand, gravelly sand, or gravel and is stratified.

Walpole Variant

The Walpole Variant consists of coarse-loamy, mixed, nonacid, mesic Aeric Haplaquepts. These deep, poorly drained soils are on glaciofluvial and glaciolacustrine deposits. The soils formed in glacial outwash over lakebed sediments. Slopes range from 0 to 3 percent.

Walpole Variant soils formed in the same kind of material as moderately well drained Amostown soils. They are similar to Raynham, Swanton, and Walpole soils. Walpole Variant soils have less sand and more silt in the substratum than the Raynham soils, have a substratum with less clay and more stratification than the Swanton soils, and have less sand throughout the profile than the Walpole soils.

Typical pedon of Walpole Variant fine sandy loam, in the town of Topsfield, in a hayfield 50 yards west of the junction of Salem Road and Main Street:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; friable; many fine roots; 15 percent fine gravel; strongly acid; abrupt smooth boundary.
B21—8 to 18 inches; olive gray (5Y 5/2) fine sandy loam; common fine prominent brown (7.5YR 4/4) mottles; weak fine granular structure; friable; few fine roots; less than 5 percent fine gravel; strongly acid; clear wavy boundary.

B22—18 to 25 inches; grayish brown (2.5Y 5/2) fine sandy loam; many fine and medium prominent light gray (5Y 7/1) and reddish brown (5YR 4/4) mottles; weak fine granular structure; friable; strongly acid; abrupt wavy boundary.

IIC—25 to 60 inches; varved sediments of 65 percent light olive brown (2.5Y 5/4) silt and 35 percent light yellowish brown (2.5Y 6/4) very fine sand; overall texture of silt loam; many medium distinct light gray (5Y 7/1) and reddish brown (5YR 4/4) mottles; massive; firm in silt, friable in very fine sand; medium acid.

The thickness of the solum ranges from 20 to 40 inches. Coarse fragments make up 0 to 20 percent of the solum. In some pedons there are thin strata of gravelly sand in the substratum. Reaction ranges from very strongly acid to medium acid in the solum and from strongly acid to slightly acid in the substratum.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It is fine sandy loam or sandy loam.

The B horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 1 to 3 and is mottled. It is fine sandy loam or sandy loam.

The IIC horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 2 to 4 and is mottled. It is silt, silt loam, or varved silt, silt loam, and very fine sand.

Wareham series

The Wareham series consists of mixed, mesic Humaqueptic Psammaquents. These deep, poorly drained soils are on outwash plains. The soils formed in sandy glacial outwash. Slopes range from 0 to 8 percent.

Wareham soils formed in the same kind of material as moderately well drained Deerfield soils, very poorly drained Scarboro soils, and excessively drained Windsor soils. They are similar to Pipestone and Walpole soils. Wareham soils do not have a spodic horizon, which the Pipestone soils have. They have more sand in the solum and are less developed than the Walpole soils.

Typical pedon of Wareham loamy sand, 0 to 3 percent slopes, in the town of Salisbury, in a forested area near the well field 1,000 feet north-northeast of the junction of Foley Mill Road and Blacksnake Road:

A1—0 to 8 inches; very dark brown (10YR 2/2) loamy sand; weak fine granular structure; very friable; many fine and medium roots; 5 percent rounded coarse fragments 2 to 15 millimeters in diameter; very strongly acid; abrupt irregular boundary.

A2—8 to 10 inches; light gray (10YR 6/1) loamy sand; very weak fine granular structure; very friable; many fine and medium roots; less than 5 percent coarse fragments; very strongly acid; abrupt discontinuous boundary.

B—10 to 17 inches; yellowish brown (10YR 5/4) loamy sand; many fine and medium prominent olive gray (5Y 5/2) and dark reddish brown (5YR 3/3) mottles; very weak fine and medium granular structure; friable; many fine and medium roots; 10 percent rounded gravel 2 to 50 millimeters in diameter; very strongly acid; abrupt wavy boundary.

C1—17 to 25 inches; dark grayish brown (10YR 4/2) medium sand; common fine and medium distinct brown (7.5YR 4/4) mottles; single grain; loose; few fine and medium roots; 15 percent rounded gravel 2 to 60 millimeters in diameter; strongly acid; abrupt wavy boundary.

C2—25 to 32 inches; dark grayish brown (10YR 4/2) medium sand; many medium distinct strong brown (7.5YR 5/6) mottles; single grain; loose; few fine roots; 15 percent rounded gravel 2 to 30 millimeters in diameter; very strongly acid; abrupt wavy boundary.

C3—32 to 60 inches; grayish brown (2.5Y 5/2) stratified fine and medium sand; many medium distinct strong brown (7.5YR 5/6) mottles; single grain; loose; 10 percent rounded gravel 2 to 10 millimeters in diameter; strongly acid.

The thickness of the solum ranges from 16 to 24 inches. The gravel content above a depth of 36 inches ranges from 0 to 15 percent and below a depth of 36 inches from 0 to 40 percent. Reaction is strongly acid to extremely acid, but in some limed areas the surface layer is slightly acid or neutral.

The A1 horizon is neutral or has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 0 to 2. It is loamy sand or loamy fine sand. Some pedons do not have an A2 horizon, or it is discontinuous. The A2 horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. It is loamy sand or sand.

The B horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4 and is mottled. It ranges from loamy fine sand to sand and loamy coarse sand.

The C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2 and is mottled. It ranges from loamy sand to coarse sand, and some pedons have strata of sand and gravel below a depth of 40 inches.

Westbrook series

The Westbrook series consists of euic, mesic Typic Sulfihemists. These deep, very poorly drained soils formed in organic deposits over loamy mineral material. The Westbrook soils are on nearly level flats bordering the Atlantic Ocean and extending inland along the major rivers. The soils are perpetually wet and are subject to tidal flooding. Slopes are less than 1 percent.

Westbrook soils are similar to the Ipswich soils and Medisaprists. Westbrook soils formed in shallower organic material than Ipswich soils. Westbrook soils formed in

saltwater marsh, and Medisaprists formed in freshwater marsh.

Typical pedon of Westbrook mucky peat, in an area of Ipswich and Westbrook mucky peats, in the town of Rowley, 350 feet south of Stackyard Road, 1-1/2 miles east of Route 1A:

Oe1—0 to 9 inches; very dark grayish brown (10YR 3/2) broken, rubbed, and pressed mucky peat; 75 percent fiber, 35 percent rubbed; massive; nonsticky; dense mat of roots; mineral content less than 5 percent by weight; many fine and medium roots; moderate hydrogen sulfide odor; slightly acid; abrupt smooth boundary.

Oe2—9 to 13 inches; black (10YR 2/1) broken, rubbed, and pressed mucky peat; 70 percent fiber, 20 percent rubbed; massive; nonsticky; 25 percent mineral content by weight; many fine roots; moderate hydrogen sulfide odor; slightly acid; abrupt smooth boundary.

Oe3—13 to 30 inches; dark brown (10YR 3/3) broken, rubbed, and pressed mucky peat; 80 percent fiber, 30 percent rubbed; massive; nonsticky; 20 percent mineral content by weight; many fine roots; moderate hydrogen sulfide odor; slightly acid; clear smooth boundary.

Oe4—30 to 36 inches; very dark grayish brown (10YR 3/2) broken, rubbed, and pressed mucky peat; 75 percent fiber, 20 percent rubbed; massive; nonsticky; 20 percent mineral content by weight; common fine roots; moderate hydrogen sulfide odor; slightly acid; clear smooth boundary.

Oe5—36 to 45 inches; very dark gray (5Y 3/1) broken, rubbed, and pressed mucky peat; 50 percent fiber, 20 percent rubbed; massive; nonsticky; 25 percent mineral content by weight; moderate hydrogen sulfide odor; neutral; clear smooth boundary.

IIC—45 to 60 inches; very dark gray (5Y 3/1) silt loam; massive; friable; neutral.

The thickness of the organic layer ranges from 16 to 51 inches. Thin layers of silt or very fine sand are in some pedons. Reaction ranges from strongly acid to neutral in the organic material and medium acid to neutral in the substratum.

The surface tier has hue of 10YR to 5Y, value of 2 to 4, and chroma of 1 or 2. Fiber content ranges from 25 to 80 percent, and 15 to 40 percent rubbed.

The subsurface and bottom tiers have hue of 10YR to 5Y, value of 2 to 4, and chroma of 1 to 3. Estimated fiber content is 20 to 85 percent, and 15 to 40 percent rubbed.

The IIC horizon has hue of 2.5Y and 5Y, value of 3 to 5, and chroma of 0 to 2. It is silt loam or very fine sandy loam. Herbaceous fibers are common.

Whately Variant

The Whately Variant consists of sandy over clayey, mixed, mesic Typic Haplaquolls. These deep, very poorly drained soils are on old glacial lakebeds. The soils formed in sandy glacial outwash material over clayey glacial lakebed sediments. Slopes range from 0 to 3 percent.

Whately Variant soils formed in the same kind of material as moderately well drained Elmwood soils, well drained Melrose soils, and poorly drained Swanton soils. They are similar to the Birdsall and Maybid soils. Whately Variant soils have more sand in the solum than the Birdsall soils. They have more sand and less clay in the solum than the Maybid soils.

Typical pedon of Whately Variant fine sandy loam, in the town of Rowley, in a forested area 1/2 mile northwest of the junction of U.S. Route 1 and Massachusetts Route 133:

O1—4 inches to 0; dark reddish brown (2.5YR 3/4) decaying organic matter.

A1—0 to 8 inches; very dark gray (10YR 3/1) fine sandy loam; weak fine granular structure; friable; many fine and medium roots; medium acid; abrupt smooth boundary.

B21—8 to 15 inches; grayish brown (2.5Y 5/2) loamy sand; common medium faint light brownish gray (2.5Y 6/2) mottles and common medium prominent dark reddish brown (5YR 3/3) mottles; single grain; loose; few fine roots; slightly acid; clear smooth boundary.

B22—15 to 23 inches; grayish brown (2.5Y 5/2) loamy sand; few medium faint light grayish brown (2.5Y 6/2) mottles and few fine prominent strong brown (7.5YR 5/6) mottles; single grain; loose; slightly acid; abrupt wavy boundary.

IIC1—23 to 30 inches; gray (N 5/0) silty clay loam; few fine distinct yellowish brown (10YR 5/6) mottles; massive; firm; neutral; gradual wavy boundary.

IIC2—30 to 60 inches; gray (N 5/0) silty clay; many fine and medium prominent strong brown (7.5YR 5/6) mottles; massive; firm; slightly acid.

The thickness of the solum is 18 to 40 inches. The soil is generally free of coarse fragments. Reaction ranges from medium acid to slightly acid in the solum and from slightly acid to neutral in the underlying material.

The A horizon has hue of 7.5YR to 2.5Y, value of 2 or 3, and chroma of 1 or 2. It ranges from very fine sandy loam to sandy loam.

The B horizon is neutral or has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 0 to 2. Some subhorizons between depths of 10 and 30 inches have hue of 2.5Y, value of 6, and chroma of 0 to 2 or have value of 4 or 5 and chroma of 2. The horizon is mainly loamy sand, but in some pedons it has thin layers of sandy loam.

The IIC horizon is neutral or has hue of 10YR to 5Y, value of 4 to 6, and chroma of 0 to 2. It is silty clay loam, clay loam, silty clay, sandy clay, or clay that is varved in some pedons. Mottles are few to many and faint to prominent.

Whitman series

The Whitman series consists of coarse-loamy, mixed, mesic Humic Fragiaquepts. These deep, very poorly drained soils are on uplands. The soils formed in loamy glacial till. Slopes range from 0 to 3 percent.

Whitman soils formed in the same kind of material as well drained Paxton soils, poorly drained Ridgebury soils, and moderately well drained Woodbridge soils. They are similar to Medisaprists, but Whitman soils formed in mineral material and Medisaprists formed in organic material.

Typical pedon of Whitman loam, in an area of Whitman extremely stony loam, in the city of Haverhill, in a forested area about 40 yards northwest of the junction of Jericho and Crystal Roads:

A1—0 to 9 inches; black (10YR 2/1) loam; very weak fine and medium granular structure; very friable; many fine medium and coarse roots; less than 5 percent angular gravel, 5 percent angular cobblestones; very strongly acid; abrupt smooth boundary.

C1g—9 to 20 inches; gray (5Y 6/1) sandy loam; few fine distinct olive gray (5Y 5/2) and yellowish brown (10YR 5/6) mottles; massive; firm; few fine roots; 15 percent angular gravel, 5 percent angular cobblestones; medium acid; clear wavy boundary.

C2xg—20 to 60 inches; gray (5Y 6/1) loamy sand; common fine and medium distinct olive gray (5Y 5/2) and yellowish brown (10YR 5/6) mottles; massive; very firm; 15 percent angular gravel, 5 percent angular cobblestones; medium acid.

The depth to the fragipan is 12 to 25 inches. The solum and underlying material contain 5 to 25 percent gravel, 0 to 10 percent cobblestones, and 0 to 10 percent stones. Reaction ranges from very strongly acid to medium acid.

The A horizon is neutral or has a hue of 10YR, value of 2 or 3, and chroma of 0 to 2. It ranges from sandy loam to loam.

The C1g horizon is neutral or has hue of 2.5Y or 5Y, value of 5 or 6, and chroma of 0 or 1. Mottles range from none to few. The horizon ranges from loam to gravelly sandy loam. It is very friable to firm.

The Cx horizon has hue of 2.5Y or 5Y, value of 5 or 6, and chroma of 0 to 2. It is fine sandy loam, sandy loam, or loamy sand. It is firm or very firm.

Windsor series

The Windsor series consists of mixed, mesic Typic Udipsamments. These deep, excessively drained soils are on outwash plains and terraces. The soils formed in sandy glacial outwash. Slopes range from 0 to 35 percent.

Windsor soils formed in the same kind of material as moderately well drained Deerfield soils, somewhat poorly drained Pipestone soils, and poorly drained Wareham soils. They are similar to Agawam, Carver, and Hinckley soils. Windsor soils have more sand in the solum than the Agawam soils, have less coarse sand than the Carver soils, and have less gravel than the Hinckley soils.

Typical pedon of Windsor loamy sand, 0 to 3 percent slopes, in the town of Andover, in a cultivated field 400 yards south of the junction of Blanchard and Osgood Streets:

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) loamy sand; weak fine granular structure; very friable; 5 percent fine gravel; strongly acid; abrupt smooth boundary.

B21—10 to 16 inches; yellowish brown (10YR 5/8) loamy sand; single grain; loose; 5 percent fine gravel; strongly acid; clear smooth boundary.

B22—16 to 22 inches; yellowish brown (10YR 5/6) sand; single grain; loose; 5 percent fine gravel; strongly acid; clear smooth boundary.

B23—22 to 28 inches; very pale brown (10YR 7/3) sand; single grain; loose; strongly acid; gradual smooth boundary.

C—28 to 60 inches; pale yellow (2.5Y 7/4) stratified sand; single grain; loose; 5 percent fine gravel; as much as 25 percent fine gravel in individual thin strata; strongly acid.

The thickness of solum ranges from 20 to 32 inches. Windsor soils are generally free of gravel, but some pedons are about 5 percent gravel in the solum and 10 percent in the C horizon. The texture within depths of 10 to 24 inches is generally loamy sand or loamy fine sand, with medium and fine sand predominant. Reaction in unlimed areas is very strongly acid to strongly acid throughout.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4. It is loamy sand or loamy fine sand.

The B21 horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is loamy sand or loamy fine sand. It has weak, fine, granular structure, or it is single grain. The B22 and B23 horizons have hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 6. They range from loamy fine sand to medium sand. It has weak, fine, granular structure, or it is single grain. Consistence is very friable or loose.

The C horizon has hue of 7.5YR to 5Y, value of 5 to 7, and chroma of 2 to 4. It is medium sand or fine sand.

Winooski series

The Winooski series consists of coarse-silty, mixed, nonacid, mesic Aquic Udifluvents. These deep, moderately well drained soils are on flood plains. The soils formed in acid alluvium derived mainly from mica schist. Slopes range from 0 to 3 percent. In this survey area the soils are a taxadjunct to the Winooski series because mottles with chroma of 2 or less are at a greater depth than is defined in the range for the series. This difference does not significantly affect the use and management of the soils.

Winooski soils formed in the same kind of material as well drained Hadley soils, poorly drained Limerick soils, and very poorly drained Saco Variant soils. They are similar to the Belgrade and Ninigret soils. Winooski soils have a substratum that has more stratification and more silt than the Belgrade soils. They have more very fine sand and silt throughout the profile than the Ninigret soils.

Typical pedon of Winooski very fine sandy loam, in the town of Groveland, in a field 150 feet east of Main Street and 1,400 feet south of its junction with Gardiner Street:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) very fine sandy loam, light brownish gray (10YR 6/2) dry; very weak fine and very fine granular structure; very friable; many fine roots; medium acid; abrupt smooth boundary.

C1—8 to 24 inches; light olive brown (2.5Y 5/4) very fine sandy loam; massive; friable; common fine roots; neutral; clear smooth boundary.

C2—24 to 38 inches; light olive brown (2.5Y 5/4) very fine sandy loam; few fine distinct light brownish gray (10YR 6/2) and strong brown (7.5YR 5/6) mottles; massive; friable; slightly acid; clear wavy boundary.

C3—38 to 60 inches; light olive brown (2.5Y 5/4) varved very fine sand and silt loam; many medium prominent gray (10YR 6/1), dark yellowish brown (10YR 4/4), and reddish yellow (5YR 6/8) mottles; massive; friable; slightly acid.

The thickness and number of horizons below the A horizon are variable and correspond to the thickness and variability of the alluvial deposits. The depth to mottling ranges from 20 to 26 inches. Reaction ranges from very strongly acid to neutral above a depth of 35 inches and medium acid to neutral below a depth of 35 inches. Typically, there are no coarse fragments in this soil, but some pedons are up to 5 percent coarse fragments.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. It is very fine sandy loam or silt loam.

The C horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 3 or 4. It is very fine sandy loam, silt loam, or loamy very fine sand.

Woodbridge series

The Woodbridge series consists of coarse-loamy, mixed, mesic Typic Fragiochrepts. These deep and moderately well drained soils are on uplands. The soils formed in compact glacial till derived mainly from schist and granite. Slopes range from 0 to 25 percent.

Woodbridge soils formed in the same kind of material as well drained Paxton soils, poorly drained Ridgebury soils, and very poorly drained Whitman soils. They are similar to the Scituate and Sutton soils. Woodbridge soils have less sand in the substratum than the Scituate soils. They have a fragipan, which the Sutton soils do not have.

Typical pedon of Woodbridge fine sandy loam, 3 to 8 percent slopes, in the town of Georgetown, in a field 700 feet southwest of the junction of Andover and West Streets:

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) fine sandy loam; very weak fine and medium granular structure; friable; many fine roots; 10 percent angular coarse fragments 2 to 20 millimeters in diameter; medium acid; abrupt smooth boundary.

B21—9 to 16 inches; yellowish brown (10YR 5/4) fine sandy loam that fades to light olive brown (2.5Y 5/4) with depth; very weak fine and medium granular structure; friable; common fine roots; many small worm holes filled with very dark grayish brown material from Ap horizon; 10 percent angular gravel; medium acid; clear wavy boundary.

B22—16 to 23 inches; olive brown (2.5Y 4/4) fine sandy loam; common fine distinct gray to light gray (5Y 6/1) and yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few fine herbaceous roots; 10 percent angular gravel, 3 percent stones; medium acid; abrupt wavy boundary.

A'2—23 to 26 inches; light olive gray (5Y 6/2) fine sandy loam; common fine distinct strong brown (7.5YR 5/6) and yellowish red (5YR 5/6) mottles; weak medium subangular blocky structure; firm; few fine roots; 15 percent angular and subrounded gravel, 3 percent stones; strongly acid; abrupt wavy boundary.

Cx—26 to 60 inches; light olive brown (2.5Y 5/4) fine sandy loam; common fine distinct strong brown (7.5YR 5/6) mottles; moderate to strong thick platy structure; very firm; 10 percent angular gravel, 3 percent stones; strongly acid.

The depth to the firm or very firm fragipan ranges from 21 to 29 inches. The depth to mottling ranges from 16 to 29 inches. The content of coarse fragments in the solum and substratum ranges from 5 to 30 percent. The reac-

tion ranges from strongly acid to medium acid. The surface layer is slightly acid to neutral where limed.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The A1 horizon is 1 unit lower in value or chroma or both. The texture of the A horizon is fine sandy loam or loam.

The B21 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. It is fine sandy loam or loam. The B22 horizon has hue of 10YR or 2.5Y with value and chroma of 4 to 6 and is distinctly mottled. It is sandy loam, fine sandy loam, or loam. Some pedons do not have an A'2 horizon.

The Cx horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 3 or 4. It is sandy loam, fine sandy loam, or loam or thin gravelly analogues.

Classification of the soils

The system of soil classification currently used was adopted by the National Cooperative Soil Survey in 1965. Readers interested in further details about the system should refer to "Soil taxonomy" (*6*).

The system of classification has six categories. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. In this system the classification is based on the different soil properties that can be observed in the field or those that can be inferred either from other properties that are observable in the field or from the combined data of soil science and other disciplines. The properties selected for the higher categories are the result of soil genesis or of factors that affect soil genesis. In table 17, the soils of the survey area are classified according to the system. Categories of the system are discussed in the following paragraphs.

ORDER. Ten soil orders are recognized as classes in the system. The properties used to differentiate among orders are those that reflect the kind and degree of dominant soil-forming processes that have taken place. Each order is identified by a word ending in *sol*. An example is Inceptisol.

SUBORDER. Each order is divided into suborders based primarily on properties that influence soil genesis and are important to plant growth or that are selected to reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Ochrept (*Ochr*, meaning pale, plus *ept*, from Inceptisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of expression of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and a prefix that suggests something about the properties of the soil. An example is Fragiochrepts (*Frag*, meaning brittle horizon, plus *ochrept*, the suborder of Inceptisols that have a pale surface).

SUBGROUP. Each great group may be divided into three subgroups: the central (typic) concept of the great groups, which is not necessarily the most extensive subgroup; the intergrades, or transitional forms to other orders, suborders, or great groups; and the extragrades, which have some properties that are representative of the great groups but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceeding the name of the great group. The adjective *Typic* identifies the subgroup that is thought to typify the great group. An example is Typic Fragiochrepts.

FAMILY. Families are established within a subgroup on the basis of similar physical and chemical properties that affect management. Among the properties considered in horizons of major biological activity below plow depth are particle-size distribution, mineral content, temperature regime, thickness of the soil penetrable by roots, consistence, moisture equivalent, soil slope, and permanent cracks. A family name consists of the name of a subgroup and a series of adjectives. The adjectives are the class names for the soil properties used as family differentiae. An example is coarse-loamy, mixed, mesic Typic Fragiochrepts.

SERIES. The series consists of soils that formed in a particular kind of material and have horizons that, except for texture of the surface soil or of the underlying substratum, are similar in differentiating characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineral and chemical composition.

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Glossary

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim. An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 40-inch profile or to a limiting layer is expressed as—

	Inches
Very low	Less than 2.4
Low	2.4 to 3.2
Moderate	3.2 to5.2
High	More than 5.2

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coat, clay skin.

Coarse fragments. Mineral or rock particles up to 3 inches (2 millimeters to 7.5 centimeters) in diameter.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures is difficult.

Complex, soil. A mapping unit of two or more kinds of soil occurring in such an intricate pattern that they cannot be shown separately on a soil map at the selected scale of mapping and publication.

Compressible. Excessive decrease in volume of soft soil under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping (or contour farming). Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave. Unstable walls of cuts made by earth-moving equipment. The soil sloughs easily.

Deferred grazing. A delay in grazing until range plants have reached a specified stage of growth. Grazing is deferred in order to increase the vigor of forage and to allow desirable plants to produce seed. Contrasts with continuous grazing and rotation grazing.

Depth to rock. Bedrock at a depth that adversely affects the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically for long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients, as for example in "hillpeats" and "climatic moors."

Drainage, surface. Runoff, or surface flow of water, from an area.

Drumlin. A low, smooth, elongated oval hill, mound, or ridge of compact glacial till. The longer axis is parallel to the path of the glacier and commonly has a blunt nose pointing in the direction from which the ice approached.

Erosion. The wearing away of the land surface by running water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes a bare surface.

Excess fines. Excess silt and clay. The soil does not provide a source of gravel or sand for construction purposes.

Excess salts. Excess water soluble salts. Excessive salts restrict the growth of most plants.

Fast intake. The rapid movement of water into the soil.

Favorable. Favorable soil features for the specified use.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Flooding. The temporary covering of soil with water from overflowing streams, runoff from adjacent slopes, and tides. Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; *November-May*, for example, means that flooding can occur during the period November through May. Water standing for short periods after rainfall or commonly covering swamps and marshes is not considered flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action. Freezing and thawing of soil moisture. Frost action can damage structures and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Glacial drift (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also the assorted and unassorted material deposited by streams flowing from glaciers.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by melt water as it flows from glacial ice.

Glacial till (geology). Unassorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits (geology). Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes by water originating mainly from the melting of glacial ice. Many are interbedded or laminated.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material from 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter.

Habitat. The natural abode of a plant or animal; refers to the kind of environment in which a plant or animal normally lives, as opposed to the range or geographical distribution.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. The major horizons of mineral soil are as follows:

O horizon.—An organic layer, fresh and decaying plant residue, at the surface of a mineral soil.

A horizon.—The mineral horizon, formed or forming at or near the surface, in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon most of which was originally part of a B horizon.

A2 horizon.—A mineral horizon, mainly a residual concentration of sand and silt high in content of resistant minerals as a result of the loss of silicate clay, iron, aluminum, or a combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or a combination of these; (2) by prismatic or blocky structure; (3) by redder or browner colors than those in the A horizon; or (4) by a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that from which the solum is presumed to have formed. If the material is known to differ from that in the solum the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered, but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow

over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip.—Application of water directly to the root zone of plants by means of applicators (orifices, emitters, porous tubing, perforated pipe, etc.) operated under low pressure. The applicators may be placed on or below the surface of the ground.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Large stones. Rock fragments 10 inches (25 centimeters) or more across. Large stones adversely affect the specified use.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. Inadequate strength for supporting loads.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is greater than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous areas. Areas that have little or no natural soil, are too nearly inaccessible for orderly examination, or cannot otherwise be feasibly classified.

Moraine (geology). An accumulation of earth, stones, and other debris deposited by a glacier. Types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark colored, finely divided, well decomposed organic soil material mixed with mineral soil material. The content of organic matter is more than 20 percent.

Outwash, glacial. Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by water that originated mainly from the melting of glacial ice. Glacial outwash is commonly in valleys on landforms known as valley trains, outwash terraces, eskers, kame terraces, kames, outwash fans, or deltas.

Outwash plain. A land form of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Pan. A compact, dense layer in a soil. A pan impedes the movement of water and the growth of roots. The word "pan" is commonly combined with other words that more explicitly indicate the nature of the layer; for example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The great variety of unconsolidated organic and mineral material in which soil forms. Consolidated bedrock is not yet parent material by this concept.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percs slowly. The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality that enables the soil to transmit water or air, measured as the number of inches per hour that water moves through the soil. Terms describing permeability are *very slow* (less than 0.06 inch), *slow* (0.06 to 0.20 inch), *moderately slow* (0.2 to 0.6 inch), *moderate* (0.6 to 2.0 inches), *moderately rapid* (2.0 to 6.0 inches), *rapid* (6.0 to 20 inches), and *very rapid* (more than 20 inches).

Phase, soil. A subdivision of a soil series or other unit in the soil classification system based on differences in the soil that affect its management. A soil series, for example, may be divided into phases on the bases of differences in slope, stoniness, thickness, or some other characteristic that affects management. These differences are too small to justify separate series.

pH value. (See Reaction, soil). A numerical designation of acidity and alkalinity in soil.

Piping. Moving water of subsurface tunnels or pipelike cavities in the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from a semisolid to a plastic state.

Poor outlets. Surface or subsurface drainage outlets difficult or expensive to install.

Productivity (soil). The capability of a soil for producing a specified plant or sequence of plants under a specified system of management. Productivity is measured in terms of output, or harvest, in relation to input.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth. Shallow root zone. The soil is shallow over a layer that greatly restricts roots. See Root zone.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged in stream channels from a drainage area. The water that flows off the land surface without sinking in is called surface runoff; that which enters the ground before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Seepage. The rapid movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils, formed from a particular type of parent material, having horizons that, except for the texture of the A or surface horizon, are similar in all profile characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineralogical and chemical composition.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slow intake. The slow movement of water into the soil.

Slow refill. The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones. Rock fragments 3 to 10 inches (7.5 to 25 centimeters) in diameter. Small stones adversely affect the specified use.

Soil. A natural, three-dimensional body at the earth's surface that is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows: *very coarse sand* (2.0 millimeters to 1.0 millimeter); *coarse sand* (1.0 to 0.5 millimeter); *medium sand* (0.5 to 0.25 millimeter); *fine sand* (0.25 to 0.10 millimeter); *very fine sand* (0.10 to 0.05 millimeter); *silt* (0.05 to 0.002 millimeter); and *clay* (less than 0.002 millimeter).

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in mature soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristics of the soil are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stratified. Arranged in strata, or layers. The term refers to geologic material. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates that are separated from adjoining aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use or management.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that it can soak into the soil or flow slowly to a prepared outlet without harm. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea. A stream terrace is frequently called a second bottom, in contrast with a flood plain, and is seldom subject to overflow. A marine terrace, generally wide, was deposited by the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt, silt loam, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or " very fine."

Thin layer. Otherwise suitable soil material too thin for the specified use.

Till plain. An extensive flat to undulating area underlain by glacial till.

Tilth, soil. The condition of the soil, especially the soil structure, as related to the growth of plants. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil (engineering). Presumably a fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but the limited geographic soil area does not justify creation of a new series.

Varve. A sedimentary layer or a lamina or sequence of

laminae deposited in a body of still water within 1 year; specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Water table. The upper limit of the soil or underlying rock material that is wholly saturated with water.

Water table, apparent. A thick zone of free water in the soil. An apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Water table, perched. A water table standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

TABLES

TABLE 1.--TEMPERATURE AND PRECIPITATION DATA

[Data were recorded in the period 1951-75 at Middleton, Mass.]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[1]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January	37.4	18.4	27.9	58	-9	22	3.40	1.71	4.77	8	12.1
February	39.0	19.4	29.2	59	-7	15	3.61	2.38	4.72	8	15.1
March	45.2	27.3	36.3	65	6	32	3.79	2.51	4.94	7	9.4
April	57.2	37.1	47.2	79	23	230	3.47	2.25	4.58	8	.8
May	67.7	46.4	57.1	87	32	530	3.50	1.75	4.91	8	.0
June	76.8	56.2	66.5	92	40	795	3.02	1.53	4.22	7	.0
July	81.4	61.9	71.6	93	47	980	2.90	1.60	3.95	6	.0
August	79.8	59.8	69.8	92	43	924	3.23	1.78	4.40	7	.0
September	72.8	52.6	62.7	90	33	681	3.73	1.70	5.37	6	.0
October	63.9	42.8	53.4	81	24	415	3.59	1.89	4.98	6	.0
November	52.2	34.5	43.4	71	15	134	4.51	2.82	6.02	8	1.0
December	40.8	23.5	32.1	63	-4	41	4.41	2.66	5.97	7	9.7
Yearly:											
Average	59.5	40.0	49.8	---	---	---	---	---	---	---	---
Extreme	---	---	---	94	-14	---	---	---	---	---	---
Total	---	---	---	---	---	4,799	43.16	36.12	49.84	86	48.1

[1]A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Data were recorded in the period 1951-75 at Middleton, Mass.]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 11	April 29	May 19
2 years in 10 later than--	April 6	April 23	May 12
5 years in 10 later than--	March 28	April 12	April 27
First freezing temperature in fall:			
1 year in 10 earlier than--	October 22	October 4	September 23
2 years in 10 earlier than--	October 29	October 12	September 29
5 years in 10 earlier than--	November 12	October 26	October 10

TABLE 3.--GROWING SEASON LENGTH

(Data were recorded in the period 1951-75 at Middleton, Mass.)

Probability	Daily minimum temperature during growing season		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	199	164	135
8 years in 10	209	175	145
5 years in 10	228	197	166
2 years in 10	247	219	186
1 year in 10	257	230	197

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
AgA	Agawam fine sandy loam, 0 to 3 percent slopes	315	0.2
AgB	Agawam fine sandy loam, 3 to 8 percent slopes	380	0.2
AgC	Agawam fine sandy loam, 8 to 15 percent slopes	125	0.1
AmA	Amostown fine sandy loam, 0 to 3 percent slopes	130	0.1
AmB	Amostown fine sandy loam, 3 to 8 percent slopes	295	0.2
Ba	Beaches	220	0.1
BeA	Belgrade very fine sandy loam, 0 to 3 percent slopes	370	0.2
BeB	Belgrade very fine sandy loam, 3 to 8 percent slopes	560	0.3
BeC	Belgrade very fine sandy loam, 8 to 15 percent slopes	95	0.1
Br	Birdsall silt loam	235	0.1
BuA	Buxton silt loam, 0 to 3 percent slopes	265	0.1
BuB	Buxton silt loam, 3 to 8 percent slopes	1,095	0.6
BuC	Buxton silt loam, 8 to 15 percent slopes	215	0.1
BxB	Buxton-Rock outcrop complex, 3 to 8 percent slopes	180	0.1
BxC	Buxton-Rock outcrop complex, 8 to 15 percent slopes	165	0.1
CaA	Canton fine sandy loam, 0 to 3 percent slopes	145	0.1
CaB	Canton fine sandy loam, 3 to 8 percent slopes	1,725	0.9
CaC	Canton fine sandy loam, 8 to 15 percent slopes	920	0.5
CaD	Canton fine sandy loam, 15 to 25 percent slopes	160	0.1
CbB	Canton very stony fine sandy loam, 3 to 8 percent slopes	3,135	1.7
CbC	Canton very stony fine sandy loam, 8 to 15 percent slopes	4,350	2.4
CbD	Canton very stony fine sandy loam, 15 to 25 percent slopes	2,405	1.3
CcB	Canton extremely stony fine sandy loam, 3 to 8 percent slopes	525	0.3
CcC	Canton extremely stony fine sandy loam, 8 to 15 percent slopes	1,620	0.9
CcD	Canton extremely stony fine sandy loam, 15 to 25 percent slopes	1,380	0.8
CDE	Canton and Charlton extremely stony fine sandy loams, steep	1,090	0.6
CeA	Carver loamy coarse sand, 0 to 3 percent slopes	325	0.2
CeB	Carver loamy coarse sand, 3 to 8 percent slopes	180	0.1
CmB	Charlton fine sandy loam, 3 to 8 percent slopes	2,190	1.2
CmC	Charlton fine sandy loam, 8 to 15 percent slopes	1,140	0.6
CmD	Charlton fine sandy loam, 15 to 25 percent slopes	480	0.3
CoB	Charlton very stony fine sandy loam, 3 to 8 percent slopes	1,040	0.6
CoC	Charlton very stony fine sandy loam, 8 to 15 percent slopes	1,010	0.6
CoD	Charlton very stony fine sandy loam, 15 to 25 percent slopes	765	0.4
CrB	Charlton-Rock outcrop-Hollis complex, 3 to 8 percent slopes	1,695	0.9
CrC	Charlton-Rock outcrop-Hollis complex, 8 to 15 percent slopes	4,090	2.2
CrD	Charlton-Rock outcrop-Hollis complex, 15 to 25 percent slopes	1,460	0.8
De	Deerfield loamy fine sand	3,880	2.1
Du	Dumps	280	0.2
ElA	Elmwood fine sandy loam, 0 to 3 percent slopes	220	0.1
ElB	Elmwood fine sandy loam, 3 to 8 percent slopes	310	0.2
Ha	Hadley very fine sandy loam	400	0.2
HfA	Hinckley loamy sand, 0 to 3 percent slopes	1,015	0.6
HfB	Hinckley loamy sand, 3 to 8 percent slopes	4,540	2.5
HfC	Hinckley loamy sand, 8 to 15 percent slopes	3,350	1.8
HfD	Hinckley loamy sand, 15 to 25 percent slopes	965	0.5
HWE	Hinckley and Windsor loamy sands, steep	2,640	1.5
IW	Ipswich and Westbrook mucky peats	9,145	4.9
LeA	Leicester fine sandy loam, 0 to 3 percent slopes	430	0.2
LeB	Leicester fine sandy loam, 3 to 8 percent slopes	290	0.2
Lr	Limerick and Rumney soils	720	0.4
Ma	Maybid silt loam	2,665	1.5
MC	Medisaprists, deep	9,410	5.1
MD	Medisaprists, shallow	1,755	1.0
MeB	Melrose fine sandy loam, 3 to 8 percent slopes	135	0.1
MmA	Merrimac fine sandy loam, 0 to 3 percent slopes	1,625	0.9
MmB	Merrimac fine sandy loam, 3 to 8 percent slopes	2,340	1.3
MmC	Merrimac fine sandy loam, 8 to 15 percent slopes	1,000	0.5
MmD	Merrimac fine sandy loam, 15 to 25 percent slopes	435	0.2
MoB	Montauk fine sandy loam, 3 to 8 percent slopes	890	0.5
MoC	Montauk fine sandy loam, 8 to 15 percent slopes	500	0.3
MoD	Montauk fine sandy loam, 15 to 25 percent slopes	195	0.1
MsB	Montauk very stony fine sandy loam, 3 to 8 percent slopes	925	0.5
MsC	Montauk very stony fine sandy loam, 8 to 15 percent slopes	1,055	0.6
MsD	Montauk very stony fine sandy loam, 15 to 25 percent slopes	505	0.3
MxC	Montauk extremely stony fine sandy loam, 5 to 20 percent slopes	340	0.2
NnA	Ninigret fine sandy loam, 0 to 3 percent slopes	360	0.2
NnB	Ninigret fine sandy loam, 3 to 8 percent slopes	535	0.3
PaB	Paxton fine sandy loam, 3 to 8 percent slopes	2,780	1.5
PaC	Paxton fine sandy loam, 8 to 15 percent slopes	1,690	0.9
PaD	Paxton fine sandy loam, 15 to 25 percent slopes	1,220	0.7
PbB	Paxton very stony fine sandy loam, 3 to 8 percent slopes	1,630	0.9

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
PbC	Paxton very stony fine sandy loam, 8 to 15 percent slopes	1,800	1.0
PbD	Paxton very stony fine sandy loam, 15 to 25 percent slopes	2,515	1.4
PcC	Paxton extremely stony fine sandy loam, 8 to 15 percent slopes	110	0.1
PcD	Paxton extremely stony fine sandy loam, 15 to 25 percent slopes	480	0.3
PcE	Paxton extremely stony fine sandy loam, 25 to 45 percent slopes	2,880	1.6
Pe	Pipestone loamy sand	1,640	0.9
Pg	Pits,gravel	2,370	1.3
Qu	Quarries	205	0.1
Ra	Raynham silt loam	510	0.3
RdA	Ridgebury fine sandy loam, 0 to 3 percent slopes	745	0.4
RdB	Ridgebury fine sandy loam, 3 to 8 percent slopes	315	0.2
RlA	Ridgebury and Leicester extremely stony fine sandy loams, 0 to 3 percent slopes	920	0.5
RlB	Ridgebury and Leicester extremely stony fine sandy loams, 3 to 8 percent slopes	2,165	1.2
RnC	Rock outcrop-Buxton complex, 3 to 15 percent slopes	540	0.3
RnD	Rock outcrop-Buxton complex, 15 to 25 percent slopes	170	0.1
RoC	Rock outcrop-Charlton-Hollis complex, 3 to 15 percent slopes	2,700	1.5
RoD	Rock outcrop-Charlton-Hollis complex, 15 to 35 percent slopes	4,085	2.2
Rx	Rock outcrop-Hollis complex	175	0.1
Sa	Saco Variant silt loam	1,425	0.8
ScA	Scantic silt loam, 0 to 3 percent slopes	2,940	1.6
ScB	Scantic silt loam, 3 to 8 percent slopes	325	0.2
Se	Scarboro mucky fine sandy loam	2,855	1.6
SgB	Scituate fine sandy loam, 3 to 8 percent slopes	775	0.4
SgC	Scituate fine sandy loam, 8 to 15 percent slopes	150	0.1
ShB	Scituate very stony fine sandy loam, 3 to 8 percent slopes	795	0.4
ShC	Scituate very stony fine sandy loam, 8 to 15 percent slopes	135	0.1
SrA	Sudbury fine sandy loam, 0 to 3 percent slopes	1,425	0.8
SrB	Sudbury fine sandy loam, 3 to 8 percent slopes	1,355	0.7
SsB	Suffield silt loam, 3 to 8 percent slopes	360	0.2
SsC	Suffield silt loam, 8 to 15 percent slopes	150	0.1
StA	Sutton fine sandy loam, 0 to 3 percent slopes	370	0.2
StB	Sutton fine sandy loam, 3 to 8 percent slopes	2,210	1.2
StC	Sutton fine sandy loam, 8 to 15 percent slopes	300	0.2
SuB	Sutton very stony fine sandy loam, 3 to 8 percent slopes	2,040	1.1
SuC	Sutton very stony fine sandy loam, 8 to 15 percent slopes	545	0.3
SwA	Swanton fine sandy loam, 0 to 3 percent slopes	310	0.2
SwB	Swanton fine sandy loam, 3 to 8 percent slopes	150	0.1
UAC	Udipsamments, rolling	1,235	0.7
UD	Udorthents, smoothed	4,250	2.2
UnA	Unadilla very fine sandy loam, 0 to 3 percent slopes	215	0.1
UnB	Unadilla very fine sandy loam, 3 to 8 percent slopes	400	0.2
UnC	Unadilla very fine sandy loam, 8 to 15 percent slopes	235	0.1
Ur	Urban land	3,820	2.1
WaA	Walpole fine sandy loam, 0 to 3 percent slopes	700	0.4
WaB	Walpole fine sandy loam, 3 to 8 percent slopes	145	0.1
Wb	Walpole Variant fine sandy loam	195	0.1
WeA	Wareham loamy sand, 0 to 3 percent slopes	1,190	0.7
WeB	Wareham loamy sand, 3 to 8 percent slopes	260	0.1
Wf	Whately Variant fine sandy loam	335	0.2
Wg	Whitman loam	490	0.3
Wh	Whitman extremely stony loam	1,465	0.8
WnA	Windsor loamy sand, 0 to 3 percent slopes	2,715	1.5
WnB	Windsor loamy sand, 3 to 8 percent slopes	4,350	2.3
WnC	Windsor loamy sand, 8 to 15 percent slopes	1,435	0.8
WnD	Windsor loamy sand, 15 to 25 percent slopes	660	0.4
WoC	Windsor-Rock outcrop complex, 3 to 15 percent slopes	255	0.1
WoD	Windsor-Rock outcrop complex, 15 to 25 percent slopes	130	0.1
Wp	Winooski very fine sandy loam	200	0.1
WrA	Woodbridge fine sandy loam, 0 to 3 percent slopes	870	0.5
WrB	Woodbridge fine sandy loam, 3 to 8 percent slopes	3,010	1.7
WrC	Woodbridge fine sandy loam, 8 to 15 percent slopes	685	0.4
WsB	Woodbridge very stony fine sandy loam, 0 to 8 percent slopes	3,760	2.1
WsC	Woodbridge very stony fine sandy loam, 8 to 15 percent slopes	810	0.4
WsD	Woodbridge very stony fine sandy loam, 15 to 25 percent slopes	160	0.1
WtB	Woodbridge extremely stony fine sandy loam, 3 to 8 percent slopes	580	0.3
WtC	Woodbridge extremely stony fine sandy loam, 8 to 15 percent slopes	160	0.1
	Water	7,695	4.1
	Total	182,000	100.0

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Corn silage	Grass-legume hay	Pasture
	Ton	Ton	AUM*
AgA---- Agawam	24	4.5	8.5
AgB---- Agawam	24	4.5	8.5
AgC---- Agawam	22	4.5	7.7
AmA, AmB---- Amostown	22	3.5	7.0
Ba**. Beaches			
BeA, BeB---- Belgrade	24	4.0	8.0
BeC---- Belgrade	22	3.5	7.0
Br---- Birdsall	---	---	---
BuA---- Buxton	22	3.0	5.5
BuB---- Buxton	22	3.5	6.5
BuC---- Buxton	20	3.5	6.5
BxB, BxC---- Buxton-Rock outcrop	---	3.0	5.5
CaA---- Canton	24	4.5	9.0
CaB---- Canton	24	4.5	9.0
CaC---- Canton	22	4.0	8.0
CaD---- Canton	18	3.5	7.0
CbB, CbC, CbD---- Canton	---	---	---
CcB, CcC, CcD---- Canton	---	---	---
CDE---- Canton and Charlton	---	---	---
CeA, CeB---- Carver	---	2.5	4.8

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn silage	Grass-legume hay	Pasture
	Ton	Ton	AUM*
CmB---- Charlton	24	4.5	9.0
CmC---- Charlton	22	4.0	8.0
CmD---- Charlton	18	3.5	7.0
CoB, CoC, CoD---- Charlton	---	---	---
CrB, CrC, CrD---- Charlton-Rock outcrop-Hollis	---	---	---
De---- Deerfield	16	3.0	6.0
Du**. Dumps			
ElA---- Elmwood	22	4.0	8.0
ElB---- Elmwood	22	4.0	8.0
Ha---- Hadley	28	4.5	8.5
HfA, HfB---- Hinckley	12	2.0	4.0
HfC---- Hinckley	---	---	---
HfD---- Hinckley	---	---	---
HWE---- Hinckley and Windsor	---	---	---
IW---- Ipswich and Westbrook	---	---	---
LeA, LeB---- Leicester	16	3.5	6.5
Lr---- Limerick and Rumney	20	3.5	6.5
Ma---- Maybid	---	---	---
MC**, MD**. Medisaprists			
MeB---- Melrose	24	4.0	8.0

See footnotes at end of table.

TABLE 5--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn silage	Grass-legume hay	Pasture
	Ton	Ton	AUM*
MmA, MmB---- Merrimac	18	3.0	6.0
MmC---- Merrimac	16	3.0	6.0
MmD---- Merrimac	14	2.5	5.5
MoB---- Montauk	22	3.5	7.0
MoC---- Montauk	20	3.5	7.0
MoD---- Montauk	18	3.0	6.0
MsB, MsC, MsD---- Montauk	---	---	---
MxC---- Montauk	---	---	---
NnA, NnB---- Ninigret	22	3.5	7.0
PaB---- Paxton	24	4.0	8.0
PaC, PaD---- Paxton	22	4.0	8.0
PbB, PbC, PbD---- Paxton	---	---	---
PcC, PcD---- Paxton	---	---	---
PcE. Paxton			
Pe---- Pipestone	12	3.0	6.0
Pg**. Pits, gravel			
Qu**. Quarries			
Ra---- Raynham	18	3.5	6.5
RdA, RdB---- Ridgebury	16	3.5	6.5
RlA, RlB---- Ridgebury and Leicester	16	3.5	6.5
RnC, RnD---- Rock outcrop-Buxton	---	---	---
RoC, RoD---- Rock outcrop-Charlton-Hollis	---	---	---

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn silage	Grass-legume hay	Pasture
	Ton	Ton	AUM*
Rx---------- Rock outcrop-Hollis	---	---	---
Sa---------- Saco Variant	---	---	---
ScA, ScB---------- Scantic	16	3.0	6.0
Se---------- Scarboro	---	---	---
SgB---------- Scituate	24	4.0	7.5
SgC---------- Scituate	22	4.0	7.5
ShB, ShC---------- Scituate	---	---	---
SrA, SrB---------- Sudbury	18	4.0	7.5
SsB---------- Suffield	24	4.0	7.5
SsC---------- Suffield	22	3.5	7.0
StA, StB---------- Sutton	22	4.0	7.5
StC---------- Sutton	20	3.5	7.0
SuB, SuC---------- Sutton	---	---	---
SwA, SwB---------- Swanton	18	3.0	6.0
UAC**. Udipsamments			
UD**. Udorthents			
UnA---------- Unadilla	21	4.5	8.5
UnB---------- Unadilla	21	4.5	8.5
UnC---------- Unadilla	20	4.5	8.5
Ur**. Urban land			
WaA, WaB---------- Walpole	18	3.0	5.5
Wb---------- Walpole Variant	20	3.0	5.5
WeA, WeB---------- Wareham	16	2.5	5.0

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn silage	Grass-legume hay	Pasture
	Ton	Ton	AUM*
Wf---------- Whately Variant	---	---	---
Wg, Wh---------- Whitman	---	---	---
WnA, WnB---------- Windsor	14	2.5	5.0
WnC---------- Windsor	12	2.5	5.0
WnD---------- Windsor	---	2.0	4.0
WoC, WoD---------- Windsor-Rock outcrop	---	---	---
Wp---------- Winooski	26	4.0	8.0
WrA---------- Woodbridge	24	4.0	8.0
WrB---------- Woodbridge	24	4.0	8.0
WrC---------- Woodbridge	22	4.0	8.0
WsB, WsC, WsD---------- Woodbridge	---	---	---
WtB, WtC---------- Woodbridge	---	---	---

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Absence of an entry indicates no acreage]

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I	1,075	---	---	---
II	27,180	8,860	14,355	3,965
III	28,215	7,205	8,390	12,620
IV	17,895	2,490	6,355	9,050
V	3,680	---	3,680	---
VI	39,160	---	4,325	34,835
VII	35,400	---	11,165	24,235
VIII	9,320	---	9,145	175

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
AgA, AgB, AgC---- Agawam	4o	Slight	Slight	Slight	Slight	Eastern white pine-- Red pine---------- Northern red oak---- Sugar maple---------	70 70 65 ---	Eastern white pine, red pine, white spruce, Norway spruce.
AmA, AmB---------- Amostown	3o	Slight	Slight	Slight	Slight	Eastern white pine-- Northern red oak---- Sugar maple---------	75 70 65	Eastern white pine, white spruce, red pine, eastern hemlock.
BeA, BeB---------- Belgrade	3o	Slight	Slight	Slight	Slight	Eastern white pine-- Red pine---------- Northern red oak---- White spruce--------	75 75 62 65	Eastern white pine, red pine, European larch, white spruce.
BeC---------- Belgrade	3r	Moderate	Slight	Slight	Slight	Eastern white pine-- Red pine---------- Northern red oak---- White spruce--------	75 75 62 65	Eastern white pine, red pine, European larch, white spruce.
Br---------- Birdsall	5w	Slight	Severe	Severe	Severe	Eastern white pine-- Red maple----------	50 50	
BuA, BuB---------- Buxton	4o	Slight	Slight	Slight	Slight	Eastern white pine--	65	Eastern white pine, white spruce.
BuC---------- Buxton	4r	Moderate	Moderate	Slight	Slight	Eastern white pine--	65	Eastern white pine, white spruce.
BxB*:								
Buxton----------	4o	Slight	Slight	Slight	Slight	Eastern white pine--	65	Eastern white pine, white spruce.
Rock outcrop.								
BxC*:								
Buxton----------	4r	Moderate	Moderate	Slight	Slight	Eastern white pine--	65	Eastern white pine, white spruce.
Rock outcrop.								
CaA, CaB, CaC---- Canton	5o	Slight	Slight	Slight	Slight	Eastern white pine-- Northern red oak---- Red pine----------	58 52 73	Eastern white pine, red pine, white spruce.
CaD---------- Canton	5r	Slight	Moderate	Slight	Slight	Eastern white pine-- Northern red oak---- Red pine----------	58 52 73	Eastern white pine, red pine, white spruce.
CbB, CbC---------- Canton	5o	Slight	Slight	Slight	Slight	Eastern white pine-- Northern red oak---- Red pine----------	58 52 73	Eastern white pine, red pine, white spruce.
CbD---------- Canton	5r	Slight	Moderate	Slight	Slight	Eastern white pine-- Northern red oak---- Red pine----------	58 52 73	Eastern white pine, red pine, white spruce.
CcB, CcC, CcD---- Canton	5x	Slight	Moderate	Slight	Slight	Eastern white pine-- Northern red oak---- Red pine----------	58 52 73	Eastern white pine, red pine, white spruce.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
CDE*:								
Canton	5x	Slight	Moderate	Slight	Slight	Eastern white pine	58	Eastern white pine,
						Northern red oak	52	red pine,
						Red pine	73	white spruce.
Charlton	4x	Slight	Moderate	Slight	Slight	Northern red oak	65	Eastern white pine,
						Eastern white pine	65	red pine,
						Red pine	70	white spruce,
						Red spruce	50	eastern hemlock,
						Red maple	55	European larch.
						Shagbark hickory	55	
CeA, CeB Carver	5s	Slight	Slight	Severe	Slight	Eastern white pine	53	Red pine,
						Red pine	60	eastern white pine,
								European larch.
CmB, CmC Charlton	4o	Slight	Slight	Slight	Slight	Northern red oak	65	Eastern white pine,
						Eastern white pine	65	red pine,
						Red pine	70	white spruce,
						Red spruce	50	eastern hemlock,
						Red maple	55	European larch.
						Shagbark hickory	55	
CmD Charlton	4r	Slight	Moderate	Slight	Slight	Northern red oak	65	Eastern white pine,
						Eastern white pine	65	red pine,
						Red pine	70	white spruce,
						Red spruce	50	eastern hemlock,
						Red maple	55	European larch.
						Shagbark hickory	55	
CoB, CoC Charlton	4o	Slight	Slight	Slight	Slight	Northern red oak	65	Eastern white pine,
						Eastern white pine	65	red pine,
						Red pine	70	white spruce,
						Red spruce	50	eastern hemlock,
						Red maple	55	European larch.
						Shagbark hickory	55	
CoD Charlton	4r	Slight	Moderate	Slight	Slight	Northern red oak	65	Eastern white pine,
						Eastern white pine	65	red pine,
						Red pine	70	white spruce,
						Red spruce	50	eastern hemlock,
						Red maple	55	European larch.
						Shagbark hickory	55	
CrB*, CrC*:								
Charlton	4o	Slight	Slight	Slight	Slight	Northern red oak	65	Eastern white pine,
						Eastern white pine	65	red pine,
						Red pine	70	white spruce,
						Red spruce	50	eastern hemlock,
						Red maple	55	European larch.
						Shagbark hickory	55	
Rock outcrop.								
Hollis	5d	Slight	Slight	Severe	Moderate	Northern red oak	47	Eastern white pine,
						Eastern white pine	55	red pine.
						Sugar maple	56	
						Red pine	47	
						White spruce	60	
						Red spruce	37	
CrD*:								
Charlton	4r	Slight	Moderate	Slight	Slight	Northern red oak	65	Eastern white pine,
						Eastern white pine	65	red pine,
						Red pine	70	white spruce,
						Red spruce	50	eastern hemlock,
						Red maple	55	European larch.
						Shagbark hickory	55	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
CrD*:								
Rock outcrop.								
Hollis	5d	Slight	Moderate	Severe	Moderate	Northern red oak	47	Eastern white pine, red pine.
						Eastern white pine	55	
						Sugar maple	56	
						Red pine	47	
						White spruce	60	
						Red spruce	37	
De Deerfield	4s	Slight	Slight	Slight	Slight	Eastern white pine	65	Eastern white pine, red pine, European larch.
						Northern red oak	55	
ElA, ElB Elmwood	3o	Slight	Slight	Slight	Slight	Eastern white pine	75	Eastern white pine, red pine, white spruce, European larch.
Ha Hadley	3o	Slight	Slight	Slight	Slight	Eastern white pine	70	Eastern white pine, red pine, black walnut, European larch.
HfA, HfB, HfC Hinckley	5s	Slight	Slight	Severe	Slight	Northern red oak	49	Eastern white pine, red pine, European larch.
						Eastern white pine	60	
						Red pine	58	
						Sugar maple	57	
HfD Hinckley	5s	Slight	Moderate	Severe	Slight	Northern red oak	49	Eastern white pine, red pine, European larch.
						Eastern white pine	60	
						Red pine	58	
						Sugar maple	57	
HWE*:								
Hinckley	5s	Slight	Moderate	Severe	Slight	Northern red oak	49	Eastern white pine, red pine, European larch.
						Eastern white pine	60	
						Red pine	58	
						Sugar maple	57	
Windsor	5s	Slight	Moderate	Severe	Slight	Eastern white pine	57	Eastern white pine, red pine.
						Northern red oak	52	
						Red pine	61	
						Sugar maple	55	
LeA, LeB Leicester	4w	Slight	Severe	Severe	Severe	Northern red oak	56	Eastern white pine, white spruce, northern white-cedar.
						Eastern white pine	69	
						Balsam fir	57	
						Red spruce	49	
Lr*:								
Limerick	4w	Slight	Severe	Severe	Severe	Eastern white pine	65	Eastern white pine, white spruce, northern white-cedar.
Rumney	4w	Slight	Severe	Severe	Severe	Eastern white pine	59	Eastern white pine, white spruce, northern white-cedar.
						Red maple	65	
Ma Maybid	5w	Slight	Severe	Severe	Severe	Red maple	55	
MeB Melrose	4o	Slight	Slight	Slight	Slight	Eastern white pine	69	Eastern white pine, red pine.
						Red pine	59	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
MmA, MmB, MmC--- Merrimac	4s	Slight	Slight	Moderate	Slight	Northern red oak----	51	Eastern white pine, red pine.
						Eastern white pine--	64	
						Sugar maple----------	58	
MmD--- Merrimac	4s	Slight	Moderate	Moderate	Slight	Northern red oak----	51	Eastern white pine, red pine.
						Eastern white pine--	64	
						Sugar maple----------	58	
MoB, MoC--- Montauk	3o	Slight	Slight	Slight	Slight	Sugar maple----------	65	Norway spruce, white spruce, European larch.
						Northern red oak----	70	
						Red pine------------	75	
						Eastern white pine--	75	
MoD--- Montauk	3r	Slight	Moderate	Slight	Slight	Sugar maple----------	65	Norway spruce, white spruce, European larch.
						Northern red oak----	70	
						Red pine------------	75	
						Eastern white pine--	75	
MsB, MsC--- Montauk	3o	Slight	Slight	Slight	Slight	Sugar maple----------	65	Norway spruce, white spruce, red pine, eastern white pine, European larch.
						Northern red oak----	70	
						Red pine------------	75	
						Eastern white pine--	75	
MsD--- Montauk	3r	Slight	Moderate	Slight	Slight	Sugar maple----------	65	Norway spruce, white spruce, red pine, eastern white pine, European larch.
						Northern red oak----	70	
						Red pine------------	75	
						Eastern white pine--	75	
MxC--- Montauk	3x	Slight	Moderate	Slight	Slight	Sugar maple----------	65	Norway spruce, white spruce, red pine, eastern white pine, European larch.
						Northern red oak----	70	
						Red pine------------	75	
						Eastern white pine--	75	
NnA, NnB--- Ninigret	3o	Slight	Slight	Slight	Slight	Red pine------------	71	Eastern white pine, white spruce.
						Eastern white pine--	75	
						Balsam fir----------	51	
PaB, PaC, PaD, PbB, PbC--- Paxton	3o	Slight	Slight	Slight	Slight	Northern red oak----	65	Red pine, eastern white pine, Norway spruce, European larch.
						Red pine------------	67	
						Eastern white pine--	66	
						Sugar maple----------	75	
PbD--- Paxton	3r	Slight	Moderate	Slight	Slight	Northern red oak----	65	Red pine, eastern white pine, Norway spruce, European larch.
						Red pine------------	67	
						Eastern white pine--	66	
						Sugar maple----------	75	
PcC--- Paxton	3x	Slight	Moderate	Slight	Slight	Northern red oak----	65	Red pine, eastern white pine, Norway spruce, European larch.
						Red pine------------	67	
						Eastern white pine--	66	
						Sugar maple----------	75	
PcD--- Paxton	3x	Slight	Moderate	Slight	Slight	Northern red oak----	65	Red pine, eastern white pine, Norway spruce, European larch.
						Red pine------------	67	
						Eastern white pine--	66	
						Sugar maple----------	75	
PcE--- Paxton	3x	Moderate	Severe	Slight	Slight	Northern red oak----	65	Red pine, eastern white pine, Norway spruce, European larch.
						Red pine------------	67	
						Eastern white pine--	66	
						Sugar maple----------	75	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
Pe---------- Pipestone	3s	Slight	Moderate	Severe	Slight	Quaking aspen--------- Bigtooth aspen-------- Eastern cottonwood---- Northern red oak----- Shagbark hickory----- White ash----------- Sugar maple---------- Swamp white oak------	60 --- --- --- --- --- --- ---	White spruce, eastern cottonwood, eastern white pine, Norway spruce.
Ra---------- Raynham	4w	Slight	Severe	Severe	Severe	Eastern white pine---- White spruce--------- Red spruce-----------	65 55 45	Eastern white pine, white spruce, northern white-cedar.
RdA, RdB---------- Ridgebury	4w	Slight	Severe	Severe	Severe	Northern red oak----- Red spruce---------- Eastern white pine---- Sugar maple----------	57 47 63 52	Eastern white pine, white spruce.
RlA*, RlB*: Ridgebury---------	4x	Slight	Severe	Severe	Severe	Northern red oak----- Red spruce---------- Eastern white pine---- Sugar maple----------	57 47 63 52	Eastern white pine, white spruce.
Leicester---------	4x	Slight	Severe	Severe	Severe	Northern red oak----- Eastern white pine---- Balsam fir---------- Red spruce----------	56 69 57 49	Eastern white pine, white spruce, northern white-cedar.
RnC*: Rock outcrop.								
Buxton----------	4r	Moderate	Moderate	Slight	Slight	Eastern white pine----	65	Eastern white pine, white spruce.
RnD*: Rock outcrop.								
Buxton----------	4r	Severe	Severe	Slight	Slight	Eastern white pine----	65	Eastern white pine, white spruce.
RoC*: Rock outcrop.								
Charlton----------	4o	Slight	Slight	Slight	Slight	Northern red oak----- Eastern white pine---- Red pine---------- Red spruce---------- Red maple---------- Shagbark hickory-----	65 65 70 50 55 55	Eastern white pine, red pine, white spruce, eastern hemlock, European larch.
Hollis----------	5d	Slight	Slight	Severe	Moderate	Northern red oak----- Eastern white pine---- Sugar maple---------- Red pine---------- White spruce--------- Red spruce----------	47 55 56 47 60 37	Eastern white pine, red pine.
RoD*: Rock outcrop.								
Charlton----------	4r	Slight	Moderate	Slight	Slight	Northern red oak----- Eastern white pine---- Red pine---------- Red spruce---------- Red maple---------- Shagbark hickory-----	65 65 70 50 55 55	Eastern white pine, red pine, white spruce, eastern hemlock, European larch.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
RoD*:								
Hollis	5d	Slight	Moderate	Severe	Moderate	Northern red oak	47	Eastern white pine, red pine.
						Eastern white pine	55	
						Sugar maple	56	
						Red pine	47	
						White spruce	60	
						Red spruce	37	
Rx*:								
Rock outcrop.								
Hollis	5d	Slight	Moderate	Severe	Moderate	Northern red oak	47	Eastern white pine, red pine.
						Eastern white pine	55	
						Sugar maple	56	
						Red pine	47	
						White spruce	60	
						Red spruce	37	
Sa Saco Variant	5w	Slight	Severe	Severe	Severe	Red maple	50	
ScA, ScB Scantic	5w	Slight	Severe	Severe	Severe	Eastern white pine	55	White spruce, northern white-cedar, eastern white pine, tamarack, balsam fir, black spruce, red spruce.
						White spruce	60	
						Balsam fir	60	
						White ash	67	
Se Scarboro	5w	Slight	Severe	Severe	Severe	Eastern white pine	55	Northern white-cedar.
						Red maple	55	
SgB, SgC, ShB, ShC Scituate	4o	Slight	Slight	Slight	Slight	Northern red oak	61	Eastern white pine, red pine, white spruce, European larch.
						Eastern white pine	65	
						Sugar maple	55	
						Red pine	70	
SrA, SrB Sudbury	4o	Slight	Slight	Slight	Slight	Eastern white pine	60	Eastern white pine, red pine, European larch, white spruce, Norway spruce.
						Northern red oak	45	
						Red spruce	47	
SsB, SsC Suffield	4o	Slight	Slight	Slight	Slight	Eastern white pine	55	Eastern white pine, red pine, white spruce, Norway spruce.
						White spruce	45	
						Sugar maple	49	
StA, StB, StC Sutton	4o	Slight	Slight	Slight	Slight	Red spruce	50	Eastern white pine, white spruce, European larch, Norway spruce, red pine.
						Sugar maple	54	
						Northern red oak	62	
						Eastern white pine	62	
						Black cherry	72	
SuB, SuC Sutton	4o	Slight	Slight	Slight	Slight	Red spruce	50	Eastern white pine, white spruce.
						Sugar maple	54	
SwA, SwB Swanton	5w	Slight	Severe	Severe	Severe	Eastern white pine	57	Eastern white pine, white spruce.
						Sugar maple	55	
						Red spruce	50	
						Red maple	55	
UnA, UnB Unadilla	3o	Slight	Slight	Slight	Slight	Sugar maple	65	Eastern white pine, Norway spruce, black cherry, European larch, red pine, white spruce.
						Eastern white pine	75	
						Northern red oak	---	
						Black cherry	---	
						White ash	---	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
UnC---------- Unadilla	3r	Moderate	Slight	Slight	Slight	Sugar maple--------- Eastern white pine-- Northern red oak---- Black cherry-------- White ash-----------	65 75 --- --- ---	Eastern white pine, Norway spruce, black cherry, European larch, red pine, white spruce.
WaA, WaB---------- Walpole	4w	Slight	Severe	Severe	Severe	Eastern white pine-- Red spruce---------- Red maple-----------	68 43 75	Eastern white pine, white spruce, northern white-cedar, Norway spruce.
Wb---------- Walpole Variant	4w	Slight	Severe	Severe	Severe	Eastern white pine-- Red spruce---------- Red maple-----------	66 43 75	Eastern white pine, white spruce, northern white-cedar, Norway spruce.
WeA, WeB---------- Wareham	4w	Slight	Severe	Severe	Severe	Eastern white pine-- Red maple---------- Red spruce----------	65 65 45	Eastern white pine.
Wf---------- Whately Variant	5w	Slight	Severe	Severe	Severe	Red maple-----------	50	Northern white-cedar.
Wg---------- Whitman	5w	Slight	Severe	Severe	Severe	Eastern white pine-- Red spruce---------- Red maple-----------	56 44 55	
Wh---------- Whitman	5x	Slight	Severe	Severe	Severe	Eastern white pine-- Red spruce---------- Red maple-----------	56 44 55	
WnA, WnB, WnC------ Windsor	5s	Slight	Slight	Severe	Slight	Eastern white pine-- Northern red oak---- Red pine---------- Sugar maple---------	57 52 61 55	Eastern white pine, red pine.
WnD---------- Windsor	5s	Slight	Moderate	Severe	Slight	Eastern white pine-- Northern red oak---- Red pine---------- Sugar maple---------	57 52 61 55	Eastern white pine, red pine.
WoC*: Windsor----------	5s	Slight	Slight	Severe	Slight	Eastern white pine-- Northern red oak---- Red pine---------- Sugar maple---------	57 52 61 55	Eastern white pine, red pine.
Rock outcrop.								
WoD*: Windsor----------	5s	Slight	Moderate	Severe	Slight	Eastern white pine-- Northern red oak---- Red pine---------- Sugar maple---------	57 52 61 55	Eastern white pine, red pine.
Rock outcrop.								
Wp---------- Winooski	3o	Slight	Slight	Slight	Slight	Northern red oak---- Eastern white pine-- White spruce-------- Sugar maple---------	70 75 70 65	Eastern white pine, red pine, European larch.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
WrA, WrB, WrC--- Woodbridge	3o	Slight	Slight	Slight	Slight	Eastern white pine-- Northern red oak---- Red pine---------- Red spruce---------- Sugar maple----------	67 72 65 50 65	Eastern white pine, red pine, European larch.
WsB, WsC--- Woodbridge	3o	Slight	Slight	Slight	Slight	Eastern white pine-- Northern red oak---- Red pine---------- Red spruce---------- Sugar maple----------	67 72 65 50 65	Eastern white pine, red pine, European larch.
WsD--- Woodbridge	3r	Slight	Moderate	Slight	Slight	Eastern white pine-- Northern red oak---- Red pine---------- Red spruce---------- Sugar maple----------	67 72 65 50 65	Eastern white pine, red pine, European larch.
WtB, WtC--- Woodbridge	3x	Moderate	Moderate	Slight	Slight	Eastern white pine-- Northern red oak---- Red pine---------- Red spruce---------- Sugar maple----------	67 72 65 50 65	Eastern white pine, red pine, European larch.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AgA---- Agawam	Slight	Slight	Slight	Slight	Slight	Slight.
AgB---- Agawam	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
AgC---- Agawam	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
AmA---- Amostown	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: frost action, low strength.	Slight.
AmB---- Amostown	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: slope, wetness.	Moderate: frost action, low strength.	Slight.
Ba*. Beaches						
BeA, BeB---- Belgrade	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action.	Slight.
BeC---- Belgrade	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: slope, frost action.	Severe: frost action.	Moderate: slope.
Br---- Birdsall	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action, corrosive.	Severe: wetness, frost action.	Severe: wetness.
BuA, BuB---- Buxton	Severe: too clayey, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Moderate: wetness.
BuC---- Buxton	Severe: too clayey, wetness.	Severe: wetness.	Severe: wetness.	Severe: slope, wetness.	Severe: frost action, low strength.	Moderate: slope, wetness.
BxB*: Buxton----	Severe: too clayey, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Moderate: wetness.
Rock outcrop.						
BxC*: Buxton----	Severe: too clayey, wetness.	Severe: wetness.	Severe: wetness.	Severe: slope, wetness.	Severe: frost action, low strength.	Moderate: slope, wetness.
Rock outcrop.						
CaA---- Canton	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Slight.
CaB---- Canton	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Slight.
CaC---- Canton	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
CaD---- Canton	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
CbB---- Canton	Severe: cutbanks cave.	Moderate: large stones.	Moderate: large stones.	Moderate: slope, large stones.	Moderate: large stones.	Moderate: large stones.
CbC---- Canton	Severe: cutbanks cave.	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope.	Moderate: slope, large stones.	Moderate: large stones.
CbD---- Canton	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
CcB---- Canton	Severe: cutbanks cave, large stones.	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: large stones.
CcC---- Canton	Severe: cutbanks cave, large stones.	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.
CcD---- Canton	Severe: slope, cutbanks cave, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
CDE*: Canton----	Severe: slope, cutbanks cave, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
Charlton----	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
CeA---- Carver	Severe: cutbanks cave.	Slight----	Slight----	Slight----	Slight----	Severe: too sandy.
CeB---- Carver	Severe: cutbanks cave.	Slight----	Slight----	Moderate: slope.	Slight----	Severe: too sandy.
CmB---- Charlton	Slight----	Slight----	Slight----	Moderate: slope.	Slight----	Slight.
CmC---- Charlton	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
CmD---- Charlton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
CoB---- Charlton	Moderate: large stones.	Moderate: large stones.	Moderate: large stones.	Moderate: slope, large stones.	Slight----	Moderate: large stones.
CoC---- Charlton	Moderate: slope, large stones.	Moderate: slope, large stones.	Moderate: large stones, slope.	Severe: slope.	Moderate: slope.	Moderate: slope, large stones.
CoD---- Charlton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
CrB*: Charlton----	Moderate: large stones.	Moderate: large stones.	Moderate: large stones.	Moderate: slope, large stones.	Slight----	Moderate: large stones.
Rock outcrop.						
Hollis----	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
CrC*:						
Charlton	Moderate: slope, large stones.	Moderate: slope, large stones.	Moderate: large stones, slope.	Severe: slope.	Moderate: slope.	Moderate: slope, large stones.
Rock outcrop.						
Hollis	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
CrD*:						
Charlton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.						
Hollis	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.
De Deerfield	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: frost action.	Severe: too sandy.
Du*. Dumps						
ElA, ElB Elmwood	Severe: wetness, too clayey.	Severe: frost action, shrink-swell.	Severe: wetness, shrink-swell.	Severe: frost action, shrink-swell.	Severe: frost action, shrink-swell.	Slight.
Ha Hadley	Severe: floods.	Severe: floods, frost action.	Severe: floods.	Severe: floods, frost action.	Severe: frost action.	Moderate: floods.
HfA Hinckley	Severe: small stones, cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: too sandy.
HfB Hinckley	Severe: small stones, cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: too sandy.
HfC Hinckley	Severe: small stones, cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope, too sandy.
HfD Hinckley	Severe: slope, small stones, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
HWE*:						
Hinckley	Severe: slope, small stones, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Windsor	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, too sandy, droughty.
IW*:						
Ipswich	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus..	Severe: wetness, floods, excess humus.	Severe: floods, wetness, excess humus.	Severe: wetness, low strength, floods.	Severe: wetness, excess salt, floods.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
IW*: Westbrook	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: floods, corrosive, excess humus.	Severe: wetness, low strength, floods.	Severe: wetness, floods, excess salt.
LeA, LeB---- Leicester	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, frost action.	Severe: wetness.
Lr*: Limerick	Severe: floods, wetness.	Severe: floods, wetness, frost action.	Severe: floods, wetness.	Severe: floods, wetness, frost action.	Severe: floods, wetness, frost action.	Severe: floods, wetness.
Rumney	Severe: floods, wetness, cutbanks cave.	Severe: floods, wetness, frost action.	Severe: floods, wetness.	Severe: floods, wetness, frost action.	Severe: floods, wetness, frost action.	Severe: floods, wetness.
Ma---- Maybid	Severe: wetness, too clayey.	Severe: wetness, low strength, frost action.	Severe: wetness, low strength.	Severe: wetness, low strength, frost action.	Severe: wetness, low strength, frost action.	Severe: wetness.
MC*, MD*. Medisaprists						
MeB---- Melrose	Severe: too clayey.	Severe: shrink-swell.	Severe: shrink-swell, wetness.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
MmA---- Merrimac	Severe: cutbanks cave.	Slight----	Slight----	Slight----	Slight----	Slight.
MmB---- Merrimac	Severe: cutbanks cave.	Slight----	Slight----	Moderate: slope.	Slight----	Slight.
MmC---- Merrimac	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
MmD---- Merrimac	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
MoB---- Montauk	Slight----	Moderate: frost action.	Slight----	Moderate: slope, frost action.	Moderate: frost action.	Slight.
MoC---- Montauk	Moderate: slope.	Moderate: slope, frost action.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
MoD---- Montauk	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
MsB---- Montauk	Moderate: large stones.	Moderate: large stones, frost action.	Moderate: large stones.	Moderate: slope, frost action.	Moderate: frost action.	Moderate: large stones.
MsC---- Montauk	Moderate: slope, large stones.	Moderate: slope, frost action.	Moderate: slope, large stones.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope, large stones.
MsD---- Montauk	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
MxC---------- Montauk	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Moderate: slope, frost action.	Severe: large stones.
NnA---------- Ninigret	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: frost action.	Slight.
NnB---------- Ninigret	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: slope, wetness.	Moderate: frost action.	Slight.
PaB---------- Paxton	Slight---------	Moderate: frost action.	Slight---------	Moderate: frost action, slope.	Moderate: frost action.	Slight.
PaC---------- Paxton	Moderate: slope.	Moderate: slope, frost action.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
PaD---------- Paxton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
PbB---------- Paxton	Moderate: large stones.	Moderate: frost action, large stones.	Moderate: large stones.	Moderate: frost action, slope, large stones.	Moderate: frost action.	Moderate: large stones.
PbC---------- Paxton	Moderate: slope, large stones.	Moderate: frost action, slope, large stones.	Moderate: slope, large stones.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope, large stones.
PbD---------- Paxton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
PcC---------- Paxton	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Moderate: frost action, slope, large stones.	Severe: large stones.
PcD, PcE---------- Paxton	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope.	Severe: slope, large stones.
Pe---------- Pipestone	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Pg*. Pits, gravel						
Qu*. Quarries						
Ra---------- Raynham	Severe: wetness.	Severe: frost action, wetness.	Severe: wetness.	Severe: frost action, wetness.	Severe: frost action, wetness.	Severe: wetness.
RdA, RdB---------- Ridgebury	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, frost action.	Severe: wetness.
RlA*, RlB*: Ridgebury---------	Severe: large stones, wetness.	Severe: large stones, wetness, frost action.	Severe: large stones, wetness.	Severe: large stones, wetness, frost action.	Severe: wetness, frost action.	Severe: large stones, wetness.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
RlA*, RlB*: Leicester	Severe: large stones, wetness.	Severe: large stones, wetness, frost action.	Severe: large stones, wetness.	Severe: large stones, wetness, frost action.	Severe: wetness, frost action.	Severe: large stones, wetness.
RnC*: Rock outcrop.						
Buxton	Severe: too clayey, wetness.	Severe: wetness.	Severe: wetness.	Severe: slope, wetness.	Severe: frost action, low strength.	Moderate: slope, wetness.
RnD*: Rock outcrop.						
Buxton	Severe: slope, too clayey, wetness.	Severe: slope, wetness.	Severe: wetness.	Severe: slope, wetness.	Severe: slope, frost action, low strength.	Severe: slope.
RoC*: Rock outcrop.						
Charlton	Moderate: slope, large stones.	Moderate: slope, large stones.	Moderate: large stones, slope.	Severe: slope.	Moderate: slope.	Moderate: slope, large stones.
Hollis	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
RoD*: Rock outcrop.						
Charlton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Hollis	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.
Rx*: Rock outcrop.						
Hollis	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.
Sa Saco Variant	Severe: floods, wetness, cutbanks cave.	Severe: floods, wetness, frost action.	Severe: floods, wetness.	Severe: floods, wetness, frost action.	Severe: floods, wetness, frost action.	Severe: floods, wetness.
ScA, ScB Scantic	Severe: wetness, too clayey.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, low strength, frost action.	Severe: wetness.
Se Scarboro	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
SgB Scituate	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action.	Slight.
SgC Scituate	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: slope, frost action.	Severe: frost action.	Moderate: slope.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
ShB---------- Scituate	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action.	Slight.
ShC---------- Scituate	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: slope, frost action.	Severe: frost action.	Moderate: slope.
SrA, SrB---------- Sudbury	Severe: wetness, cutbanks cave, small stones.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness, frost action.	Slight.
SsB---------- Suffield	Slight---------	Severe: frost action.	Moderate: low strength.	Severe: frost action.	Severe: frost action, low strength.	Slight.
SsC---------- Suffield	Moderate: slope.	Severe: frost action.	Moderate: slope, low strength.	Severe: slope, frost action.	Severe: frost action, low strength.	Moderate: slope.
StA---------- Sutton	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: frost action.	Slight.
StB---------- Sutton	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: slope, wetness.	Moderate: frost action.	Slight.
StC---------- Sutton	Severe: wetness.	Moderate: slope, wetness.	Severe: wetness.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
SuB---------- Sutton	Severe: wetness.	Moderate: large stones, wetness.	Severe: wetness.	Moderate: slope, large stones, wetness.	Moderate: frost action.	Moderate: large stones.
SuC---------- Sutton	Severe: wetness.	Moderate: slope, large stones, wetness.	Severe: wetness.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope, large stones.
SwA, SwB---------- Swanton	Severe: wetness, too clayey.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, frost action, low strength.	Moderate: wetness.
UAC*. Udipsamments						
UD*. Udorthents						
UnA---------- Unadilla	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: low strength.	Slight.
UnB---------- Unadilla	Slight---------	Slight---------	Slight---------	Moderate: slope.	Moderate: low strength.	Slight.
UnC---------- Unadilla	Moderate: slope.			Severe: slope.	Moderate: slope, low strength.	Moderate: slope.
Ur*. Urban land						
WaA, WaB---------- Walpole	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, frost action.	Severe: wetness.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Wb---------- Walpole Variant	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, frost action.	Severe: wetness.
WeA---------- Wareham	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, too sandy.
WeB---------- Wareham	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness, too sandy.
Wf---------- Whately Variant	Severe: wetness, too clayey.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, frost action.	Severe: wetness.
Wg---------- Whitman	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, frost action.	Severe: wetness.
Wh---------- Whitman	Severe: wetness, large stones.	Severe: wetness, frost action, large stones.	Severe: wetness, large stones.	Severe: large stones, wetness, frost action.	Severe: wetness, frost action.	Severe: large stones, wetness.
WnA---------- Windsor	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Severe: too sandy, droughty.
WnB---------- Windsor	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Severe: too sandy, droughty.
WnC---------- Windsor	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: too sandy, droughty.
WnD---------- Windsor	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, too sandy, droughty.
WoC*: Windsor----------	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: too sandy, droughty.
Rock outcrop.						
WoD*: Windsor----------	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, too sandy, droughty.
Rock outcrop.						
Wp---------- Winooski	Severe: floods.	Severe: floods, frost action.	Severe: floods.	Severe: floods, frost action.	Moderate: floods.	Moderate: floods.
WrA, WrB---------- Woodbridge	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action.	Slight.
WrC---------- Woodbridge	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: slope.	Severe: frost action.	Moderate: slope.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
WsB---------- Woodbridge	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action.	Moderate: large stones.
WsC---------- Woodbridge	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: slope, frost action.	Severe: frost action.	Moderate: large stones.
WsD---------- Woodbridge	Severe: slope, wetness.	Severe: slope, frost action.	Severe: slope, wetness.	Severe: slope, frost action.	Severe: slope, frost action.	Severe: slope, large stones.
WtB---------- Woodbridge	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action.	Severe: large stones.
WtC---------- Woodbridge	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: slope, frost action.	Severe: frost action.	Severe: large stones.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AgA, AgB Agawam	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Good.
AgC Agawam	Moderate: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: seepage.	Fair: slope.
AmA, AmB Amostown	Severe: wetness, percs slowly.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Good.
Ba*. Beaches					
BeA, BeB Belgrade	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Good.
BeC Belgrade	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.	Fair: slope.
Br Birdsall	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
BuA Buxton	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Severe: wetness.	Fair: thin layer.
BuB Buxton	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Fair: thin layer.
BuC Buxton	Severe: percs slowly, wetness.	Severe: slope.	Severe: wetness.	Severe: wetness.	Fair: slope, thin layer.
BxB*: Buxton	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Fair: thin layer.
Rock outcrop.					
BxC*: Buxton	Severe: percs slowly, wetness.	Severe: slope.	Severe: wetness.	Severe: wetness.	Fair: slope, thin layer.
Rock outcrop.					
CaA, CaB Canton	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: small stones, thin layer.
CaC Canton	Moderate: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: seepage.	Fair: slope, small stones, thin layer.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
CaD---- Canton	Severe: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: slope, seepage.	Poor: slope.
CbB---- Canton	Moderate: large stones.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: large stones, thin layer.
CbC---- Canton	Moderate: slope, large stones.	Severe: slope, seepage.	Severe: seepage.	Severe: seepage.	Fair: slope, large stones, thin layer.
CbD---- Canton	Severe: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: slope, seepage.	Poor: slope.
CcB---- Canton	Severe: large stones.	Severe: seepage.	Severe: seepage, large stones.	Severe: seepage.	Poor: large stones.
CcC---- Canton	Severe: large stones.	Severe: slope, seepage.	Severe: seepage, large stones.	Severe: seepage.	Poor: large stones.
CcD---- Canton	Severe: slope, large stones.	Severe: slope, seepage.	Severe: seepage, large stones.	Severe: slope, seepage.	Poor: slope, large stones.
CDE*: Canton----	Severe: slope, large stones.	Severe: slope, seepage.	Severe: slope, seepage, large stones.	Severe: slope, seepage.	Poor: slope, large stones.
Charlton----	Severe: slope, large stones.	Severe: seepage, slope.	Severe: slope, seepage, large stones.	Severe: seepage, slope.	Poor: slope, large stones.
CeA, CeB---- Carver	Slight----	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: thin layer, too sandy, area reclaim.
CmB---- Charlton	Slight----	Severe: seepage.	Severe: seepage.	Severe: seepage.	Good.
CmC---- Charlton	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope.
CmD---- Charlton	Severe: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage, slope.	Poor: slope.
CoB---- Charlton	Moderate: large stones.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: large stones.
CoC---- Charlton	Moderate: slope, large stones.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope, large stones.
CoD---- Charlton	Severe: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage, slope.	Poor: slope.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
CrB*:					
Charlton	Moderate: large stones.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: large stones.
Rock outcrop.					
Hollis	Severe: depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: thin layer, area reclaim.
CrC*:					
Charlton	Moderate: slope, large stones.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope, large stones.
Rock outcrop.					
Hollis	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: thin layer, area reclaim.
CrD*:					
Charlton	Severe: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage, slope.	Poor: slope.
Rock outcrop.					
Hollis	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
De Deerfield	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: too sandy, area reclaim.
Du*. Dumps					
ElA Elmwood	Severe: percs slowly, wetness.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Fair: thin layer.
ElB Elmwood	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Fair: thin layer.
Ha Hadley	Severe: floods.	Severe: floods, seepage.	Severe: floods, seepage.	Severe: floods, seepage.	Good.
HfA, HfB Hinckley	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: too sandy.
HfC Hinckley	Moderate: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: seepage.	Poor: too sandy.
HfD Hinckley	Severe: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: slope, seepage.	Poor: slope, too sandy.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
HWE*:					
Hinckley	Severe: slope.	Severe: slope, seepage.	Severe: slope, seepage.	Severe: slope, seepage.	Poor: slope, too sandy.
Windsor	Severe: slope.	Severe: slope, seepage.	Severe: slope, seepage.	Severe: slope, seepage.	Poor: slope, too sandy.
IW*:					
Ipswich	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Poor: excess humus, wetness, hard to pack.
Westbrook	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Poor: excess humus, wetness, hard to pack.
LeA, LeB Leicester	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Poor: wetness.
Lr*:					
Limerick	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Severe: floods, wetness.	Poor: floods, wetness.
Rumney	Severe: floods, wetness.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Poor: wetness, floods.
Ma Maybid	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: wetness, too clayey.
MC*, MD*. Medisaprists					
MeB Melrose	Severe: percs slowly, wetness.	Moderate: slope.	Severe: too clayey, wetness.	Severe: wetness.	Fair: thin layer.
MmA, MmB Merrimac	Slight	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: thin layer, area reclaim.
MmC Merrimac	Moderate: slope.	Severe: slope, seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: thin layer, area reclaim.
MmD Merrimac	Severe: slope.	Severe: slope, seepage.	Severe: seepage, too sandy.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
MoB Montauk	Severe: percs slowly.	Moderate: slope.	Slight	Slight	Good.
MoC Montauk	Severe: percs slowly.	Severe: slope.	Slight	Moderate: slope.	Fair: slope.
MoD Montauk	Severe: slope, percs slowly.	Severe: slope.	Moderate: slope.	Severe: slope.	Poor: slope.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
MsB---------- Montauk	Severe: percs slowly.	Moderate: large stones.	Moderate: large stones.	Slight----------	Fair: large stones.
MsC---------- Montauk	Severe: percs slowly.	Severe: slope.	Moderate: large stones.	Moderate: slope.	Fair: slope, large stones.
MsD---------- Montauk	Severe: slope, percs slowly.	Severe: slope.	Moderate: slope, large stones.	Severe: slope.	Poor: slope.
MxC---------- Montauk	Severe: percs slowly, large stones.	Severe: slope, large stones.	Severe: large stones.	Moderate: slope.	Poor: large stones.
NnA, NnB---------- Ninigret	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Fair: thin layer, area reclaim.
PaB---------- Paxton	Severe: percs slowly.	Moderate: slope.	Slight----------	Slight----------	Good.
PaC---------- Paxton	Severe: percs slowly.	Severe: slope.	Slight----------	Moderate: slope.	Fair: slope.
PaD---------- Paxton	Severe: slope, percs slowly.	Severe: slope.	Moderate: slope.	Severe: slope.	Poor: slope.
PbB---------- Paxton	Severe: percs slowly.	Moderate: slope.	Moderate: large stones.	Slight----------	Fair: large stones.
PbC---------- Paxton	Severe: percs slowly.	Severe: slope.	Moderate: large stones.	Moderate: large stones.	Fair: large stones, slope.
PbD---------- Paxton	Severe: slope, percs slowly.	Severe: slope.	Moderate: slope, large stones.	Severe: slope.	Poor: slope.
PcC---------- Paxton	Severe: percs slowly, large stones.	Severe: slope.	Severe: large stones.	Moderate: slope.	Poor: large stones.
PcD---------- Paxton	Severe: slope, percs slowly, large stones.	Severe: slope.	Severe: large stones.	Severe: slope.	Poor: slope, large stones.
PcE---------- Paxton	Severe: slope, percs slowly, large stones.	Severe: slope.	Severe: slope, large stones.	Severe: slope.	Poor: slope, large stones.
Pe---------- Pipestone	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage, too sandy.	Severe: wetness, seepage.	Poor: too sandy, seepage, wetness.
Pg*. Pits, gravel					
Qu*. Quarries					

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Ra Raynham	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
RdA Ridgebury	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness, small stones.
RdB Ridgebury	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness, small stones.
RlA*, RlB*: Ridgebury	Severe: large stones, percs slowly, wetness.	Moderate: large stones.	Severe: wetness, large stones.	Severe: wetness.	Poor: wetness, large stones.
Leicester	Severe: large stones, wetness.	Severe: wetness, seepage.	Severe: large stones, wetness, seepage.	Severe: wetness, seepage.	Poor: large stones, wetness.
RnC*: Rock outcrop.					
Buxton	Severe: percs slowly, wetness.	Severe: slope.	Severe: wetness.	Severe: wetness.	Fair: slope, thin layer.
RnD*: Rock outcrop.					
Buxton	Severe: slope, percs slowly, wetness.	Severe: slope.	Severe: wetness.	Severe: slope, wetness.	Poor: slope.
RoC*: Rock outcrop.					
Charlton	Moderate: slope, large stones.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope, large stones.
Hollis	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: thin layer, area reclaim.
RoD*: Rock outcrop.					
Charlton	Severe: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage, slope.	Poor: slope.
Hollis	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
Rx*: Rock outcrop.					
Hollis	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Sa---------- Saco Variant	Severe: floods, wetness.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Poor: wetness, too sandy.
ScA---------- Scantic	Severe: percs slowly, wetness.	Slight----------	Severe: wetness, too clayey.	Severe: wetness.	Poor: wetness, too clayey, thin layer.
ScB---------- Scantic	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: wetness, too clayey, thin layer.
Se---------- Scarboro	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
SgB---------- Scituate	Severe: percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: thin layer.
SgC---------- Scituate	Severe: percs slowly.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.	Fair: thin layer.
ShB---------- Scituate	Severe: percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: large stones, thin layer.
ShC---------- Scituate	Severe: percs slowly.	Severe: slope, wetness, large stones.	Severe: wetness.	Severe: wetness.	Fair: large stones, thin layer.
SrA, SrB---------- Sudbury	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Poor: thin layer, area reclaim.
SsB---------- Suffield	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight----------	Fair: thin layer.
SsC---------- Suffield	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Fair: slope, thin layer.
StA, StB---------- Sutton	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Good.
StC---------- Sutton	Severe: wetness.	Severe: slope, wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Fair: slope.
SuB---------- Sutton	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Fair: large stones.
SuC---------- Sutton	Severe: wetness.	Severe: slope, wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Fair: slope, large stones.
SwA---------- Swanton	Severe: wetness, percs slowly.	Slight----------	Severe: wetness, too clayey.	Severe: wetness, seepage.	Poor: wetness.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
SwB---------- Swanton	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness, seepage.	Poor: wetness.
UAC*. Udipsamments					
UD*. Udorthents					
UnA, UnB---------- Unadilla	Slight----------	Moderate: slope.	Slight----------	Slight----------	Good.
UnC---------- Unadilla	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
Ur*. Urban land					
WaA, WaB---------- Walpole	Severe: wetness.	Severe: wetness, seepage.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
Wb---------- Walpole Variant	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness.	Severe: wetness.	Poor: wetness.
WeA, WeB---------- Wareham	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
Wf---------- Whately Variant	Severe: wetness, percs slowly.	Slight----------	Severe: wetness, too clayey.	Severe: wetness.	Poor: wetness, too clayey.
Wg---------- Whitman	Severe: percs slowly, wetness.	Slight----------	Severe: wetness.	Severe: wetness.	Poor: wetness, thin layer.
Wh---------- Whitman	Severe: percs slowly, wetness, large stones.	Severe: large stones.	Severe: large stones, wetness.	Severe: wetness.	Poor: large stones, wetness, thin layer.
WnA, WnB---------- Windsor	Slight----------	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: too sandy.
WnC---------- Windsor	Moderate: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: seepage.	Poor: too sandy.
WnD---------- Windsor	Severe: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: slope, seepage.	Poor: slope, too sandy.
WoC*: Windsor----------	Moderate: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: seepage.	Poor: too sandy.
Rock outcrop.					
WoD*: Windsor----------	Severe: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: slope, seepage.	Poor: slope, too sandy.
Rock outcrop.					

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Wp---------- Winooski	Severe: floods, wetness.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Good.
WrA, WrB---------- Woodbridge	Severe: percs slowly.	Moderate: small stones.	Severe: wetness.	Severe: wetness.	Fair: small stones.
WrC---------- Woodbridge	Severe: percs slowly.	Severe: slope.	Severe: wetness.	Severe: wetness.	Fair: small stones.
WsB---------- Woodbridge	Severe: percs slowly.	Moderate: large stones.	Severe: wetness.	Severe: wetness.	Fair: large stones.
WsC---------- Woodbridge	Severe: percs slowly.	Severe: slope, large stones.	Severe: wetness.	Severe: wetness.	Fair: large stones.
WsD---------- Woodbridge	Severe: slope, percs slowly.	Severe: slope, large stones.	Severe: wetness.	Severe: slope, wetness.	Poor: slope, large stones.
WtB---------- Woodbridge	Severe: percs slowly.	Severe: large stones.	Severe: wetness.	Severe: wetness.	Poor: large stones.
WtC---------- Woodbridge	Severe: percs slowly.	Severe: slope, large stones.	Severe: wetness.	Severe: wetness.	Poor: large stones.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and "poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AgA, AgB---------- Agawam	Good----------	Good----------	Good----------	Fair: thin layer.
AgC---------- Agawam	Good----------	Good----------	Good----------	Fair: slope, thin layer.
AmA, AmB---------- Amostown	Fair: frost action, low strength.	Poor: excess fines.	Unsuited: excess fines.	Good.
Ba*. Beaches				
BeA, BeB---------- Belgrade	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
BeC---------- Belgrade	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope.
Br---------- Birdsall	Poor: wetness, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
BuA, BuB---------- Buxton	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
BuC---------- Buxton	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, too clayey.
BxB*: Buxton----------	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
Rock outcrop.				
BxC*: Buxton----------	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, too clayey.
Rock outcrop.				
CaA, CaB, CaC---------- Canton	Good----------	Poor: excess fines.	Unsuited: excess fines.	Poor: small stones.
CaD---------- Canton	Fair: slope.	Poor: excess fines.	Unsuited: excess fines.	Poor: slope, small stones.
CbB, CbC---------- Canton	Good----------	Poor: excess fines.	Unsuited: excess fines.	Poor: large stones.
CbD---------- Canton	Fair: slope.	Poor: excess fines.	Unsuited: excess fines.	Poor: slope, large stones.
CcB, CcC---------- Canton	Fair: large stones.	Poor: excess fines.	Unsuited: excess fines.	Poor: large stones.
CcD---------- Canton	Fair: slope, large stones.	Poor: excess fines.	Unsuited: excess fines.	Poor: slope, large stones.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
CDE*:				
Canton	Poor: slope.	Poor: excess fines.	Unsuited: excess fines.	Poor: slope, large stones.
Charlton	Poor: slope.	Unsuited: excess fines.	Poor: large stones, excess fines.	Poor: slope, large stones.
CeA, CeB---- Carver	Good	Good	Unsuited: excess fines.	Poor: too sandy, area reclaim.
CmB---- Charlton	Good	Unsuited: excess fines.	Poor: excess fines.	Fair: small stones.
CmC---- Charlton	Good	Unsuited: excess fines.	Poor: excess fines.	Fair: small stones, slope.
CmD---- Charlton	Fair: slope.	Unsuited: excess fines.	Poor: excess fines.	Poor: slope.
CoB, CoC---- Charlton	Good	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones.
CoD---- Charlton	Fair: slope.	Unsuited: excess fines.	Poor: excess fines.	Poor: slope, large stones.
CrB*, CrC*:				
Charlton	Good	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones.
Rock outcrop.				
Hollis	Poor: thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, area reclaim, large stones.
CrD*:				
Charlton	Fair: slope.	Unsuited: excess fines.	Poor: excess fines.	Poor: slope, large stones.
Rock outcrop.				
Hollis	Poor: thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, thin layer, area reclaim.
De---- Deerfield	Fair: frost action.	Good	Unsuited: excess fines.	Poor: too sandy.
Du*. Dumps				
ElA, ElB---- Elmwood	Poor: shrink-swell, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Ha---- Hadley	Poor: frost action.	Poor: excess fines.	Unsuited: excess fines.	Good.
HfA, HfB, HfC---- Hinckley	Good	Good	Good	Poor: too sandy, area reclaim.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
HfD---- Hinckley	Fair: slope.	Good----	Good----	Poor: slope, too sandy, area reclaim.
HWE*: Hinckley----	Poor: slope.	Good----	Good----	Poor: slope, too sandy, area reclaim.
Windsor----	Poor: slope.	Good----	Poor: excess fines.	Poor: slope, too sandy, area reclaim
IW*: Ipswich----	Poor: excess humus, wetness, low strength.	Unsuited: excess humus, excess fines.	Unsuited: excess humus, excess fines.	Poor: wetness, excess salt.
Westbrook----	Poor: excess humus, wetness.	Unsuited: excess humus, excess fines.	Unsuited: excess humus, excess fines.	Poor: wetness, excess salt.
LeA, LeB---- Leicester	Poor: wetness, frost action.	Unsuited: excess fines.	Poor: excess fines.	Poor: wetness.
Lr*: Limerick----	Poor: wetness, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Rumney----	Poor: wetness.	Fair: excess fines.	Unsuited: excess fines.	Poor: wetness.
Ma---- Maybid	Poor: wetness, low strength, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness, thin layer, too clayey.
MC*, MD*. Medisaprists				
MeB---- Melrose	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
MmA, MmB---- Merrimac	Good----	Good----	Good----	Fair: thin layer, area reclaim.
MmC---- Merrimac	Good----	Good----	Good----	Fair: slope, thin layer, area reclaim.
MmD---- Merrimac	Fair: slope.	Good----	Good----	Poor: slope.
MoB---- Montauk	Fair: frost action.	Poor: excess fines.	Poor: excess fines.	Fair: thin layer.
MoC---- Montauk	Fair: frost action.	Poor: excess fines.	Poor: excess fines.	Fair: slope, thin layer.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
MoD---------- Montauk	Fair: slope, frost action.	Poor: excess fines.	Poor: excess fines.	Poor: slope.
MsB, MsC---------- Montauk	Fair: frost action.	Poor: excess fines.	Poor: excess fines.	Poor: large stones, small stones.
MsD---------- Montauk	Fair: slope, frost action.	Poor: excess fines.	Poor: excess fines.	Poor: slope, small stones, large stones.
MxC---------- Montauk	Fair: frost action, large stones.	Poor: excess fines.	Poor: excess fines.	Poor: large stones, small stones.
NnA, NnB---------- Ninigret	Fair: frost action.	Good----------	Fair: excess fines.	Good.
PaB, PaC, PaD--------- Paxton	Fair: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: small stones.
PbB, PbC---------- Paxton	Fair: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: large stones.
PbD---------- Paxton	Fair: slope, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, large stones.
PcC---------- Paxton	Fair: frost action, large stones.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: large stones.
PcD---------- Paxton	Fair: slope, frost action, large stones.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, large stones.
PcE---------- Paxton	Poor: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, large stones.
Pe---------- Pipestone	Poor: wetness.	Good----------	Unsuited: excess fines.	Poor: wetness.
Pg*. Pits, gravel				
Qu*. Quarries				
Ra---------- Raynham	Poor: frost action, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
RdA, RdB---------- Ridgebury	Poor: wetness, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness, small stones.
RlA*, RlB*: Ridgebury----------	Poor: wetness, frost action, large stones.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness, large stones.
Leicester----------	Poor: large stones, wetness, frost action.	Unsuited: excess fines.	Poor: excess fines.	Poor: wetness, large stones.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
RnC*: Rock outcrop.				
Buxton	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope; too clayey.
RnD*: Rock outcrop.				
Buxton	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
RoC*: Rock outcrop.				
Charlton	Good	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones.
Hollis	Poor: thin layer, area reclaim.	Unsuited: thin layer, excess fines.	Unsuited: thin layer, excess fines.	Poor: thin layer, area reclaim, large stones.
RoD*: Rock outcrop.				
Charlton	Fair: slope.	Unsuited: excess fines.	Poor: excess fines.	Poor: slope, large stones.
Hollis	Poor: thin layer, area reclaim.	Unsuited: thin layer, excess fines.	Unsuited: thin layer, excess fines.	Poor: slope, thin layer, area reclaim.
Rx*: Rock outcrop.				
Hollis	Poor: slope, thin layer, area reclaim.	Unsuited: thin layer, excess fines.	Unsuited: thin layer, excess fines.	Poor: slope, thin layer, area reclaim.
Sa Saco Variant	Poor: wetness, frost action.	Poor: excess fines.	Unsuited: excess fines.	Poor: wetness, thin layer.
ScA, ScB Scantic	Poor: frost action, wetness, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Se Scarboro	Poor: wetness.	Good	Poor	Poor: wetness, too sandy.
SgB, SgC Scituate	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
ShB, ShC Scituate	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: large stones.
SrA, SrB Sudbury	Fair: wetness.	Good	Good	Fair: small stones, area reclaim.
SsB Suffield	Poor: low strength, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Good.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
SsC---------- Suffield	Poor: low strength, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope.
StA, StB---------- Sutton	Good----------	Unsuited: excess fines.	Poor: excess fines.	Fair: small stones.
StC---------- Sutton	Good----------	Unsuited: excess fines.	Poor: excess fines.	Fair: slope, small stones.
SuB, SuC---------- Sutton	Good----------	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones.
SwA, SwB---------- Swanton	Poor: wetness, low strength, frost action.	Poor: excess fines, thin layer.	Unsuited: excess fines.	Poor: wetness.
UAC*. Udipsamments				
UD*. Udorthents				
UnA, UnB---------- Unadilla	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
UnC---------- Unadilla	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope.
Ur*. Urban land				
WaA, WaB---------- Walpole	Poor: wetness.	Fair: excess fines.	Fair: excess fines.	Poor: wetness.
Wb---------- Walpole Variant	Poor: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
WeA, WeB---------- Wareham	Poor: wetness.	Fair: excess fines.	Unsuited: excess fines.	Poor: wetness, too sandy.
Wf---------- Whately Variant	Poor: wetness, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Wg---------- Whitman	Poor: wetness, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Wh---------- Whitman	Poor: large stones, wetness, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness, large stones.
WnA, WnB, WnC--------- Windsor	Good----------	Good----------	Poor: excess fines.	Poor: too sandy.
WnD---------- Windsor	Fair: slope.	Good----------	Poor: excess fines.	Poor: slope, too sandy.
WoC*: Windsor----------	Good----------	Good----------	Poor: excess fines.	Poor: too sandy.
Rock outcrop.				

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
WoD*:				
Windsor	Fair: slope.	Good	Poor: excess fines.	Poor: slope, too sandy.
Rock outcrop.				
Wp Winooski	Poor: frost action.	Poor: excess fines.	Unsuited: excess fines.	Good.
WrA, WrB, WrC Woodbridge	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: small stones.
WsB, WsC Woodbridge	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: large stones.
WsD Woodbridge	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, large stones.
WtB, WtC Woodbridge	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: large stones.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. Absence of an entry indicates that the soil was not evaluated]

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Grassed waterways
AgA, AgB, AgC---- Agawam	Slope, seepage.	Seepage, piping.	No water----------	Not needed--------	Slope, erodes easily.
AmA, AmB---------- Amostown	Seepage----------	Piping, compressible.	Slow refill------	Favorable---------	Favorable.
Ba*. Beaches					
BeA, BeB, BeC----- Belgrade	Slope----------	Piping, erodes easily, low strength.	Deep to water----	Wetness----------	Slope, wetness, erodes easily.
Br---------- Birdsall	Favorable--------	Wetness, piping.	Slow refill------	Poor outlets------	Wetness, rooting depth, erodes easily.
BuA, BuB, BuC----- Buxton	Percs slowly, wetness.	Piping, erodes easily.	Slow refill------	Percs slowly------	Percs slowly, erodes easily.
BxB*, BxC*: Buxton----------	Percs slowly, wetness.	Piping, erodes easily.	Slow refill------	Percs slowly------	Percs slowly, erodes easily.
Rock outcrop.					
CaA, CaB, CaC, CaD---------- Canton	Slope, seepage.	Piping, seepage.	No water---------	Not needed--------	Slope, erodes easily.
CbB, CbC, CbD, CcB, CcC, CcD---- Canton	Slope, seepage.	Piping, hard to pack, large stones.	No water---------	Not needed--------	Slope, large stones, erodes easily.
CDE*: Canton----------	Slope, seepage.	Piping, hard to pack, large stones.	No water---------	Not needed--------	Slope, large stones, erodes easily.
Charlton---------	Seepage, slope.	Seepage, large stones.	No water---------	Not needed--------	Large stones, slope, erodes easily.
CeA, CeB---------- Carver	Slope, seepage.	Seepage----------	No water---------	Not needed--------	Slope, too sandy.
CmB, CmC, CmD----- Charlton	Seepage, slope.	Seepage----------	No water---------	Not needed--------	Slope, erodes easily.
CoB, CoC, CoD----- Charlton	Seepage, slope.	Seepage, large stones.	No water---------	Not needed--------	Large stones, slope, erodes easily.
CrB*, CrC*, CrD*: Charlton---------	Seepage, slope.	Seepage, large stones.	No water---------	Not needed--------	Large stones, slope, erodes easily.
Rock outcrop.					
Hollis----------	Slope, depth to rock, seepage.	Thin layer, piping, seepage.	No water, depth to rock.	Not needed--------	Slope, droughty, rooting depth.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Grassed waterways
De---------- Deerfield	Slope, seepage.	Seepage, piping.	Deep to water, cutbanks cave.	Slope, cutbanks cave.	Slope.
Du*. Dumps					
ElA, ElB---------- Elmwood	Slope----------	Low strength, hard to pack, shrink-swell.	Deep to water----	Wetness, percs slowly, slope.	Slope, wetness, percs slowly.
Ha---------- Hadley	Seepage----------	Piping, seepage.	No water---------	Not needed--------	Not needed.
HfA, HfB, HfC, HfD---------- Hinckley	Slope, seepage.	Thin layer, seepage.	No water---------	Not needed--------	Slope, droughty.
HWE*: Hinckley---------	Slope, seepage.	Thin layer, seepage.	No water---------	Not needed--------	Slope, droughty.
Windsor----------	Seepage, slope.	Seepage, piping.	No water---------	Not needed--------	Droughty, slope.
IW*: Ipswich----------	Excess humus, seepage.	Excess humus, hard to pack, seepage.	Salty water------	Floods, excess salt, poor outlets.	Not needed.
Westbrook--------	Excess humus, seepage.	Hard to pack, excess humus, seepage.	Salty water------	Floods, wetness, excess salt.	Not needed.
LeA, LeB---------- Leicester	Seepage, slope.	Seepage----------	Favorable--------	Wetness----------	Wetness.
Lr*: Limerick---------	Seepage----------	Piping, low strength.	Favorable--------	Wetness, floods.	Wetness.
Rumney----------	Seepage----------	Piping, seepage.	Favorable--------	Wetness, floods, poor outlets.	Not needed.
Ma---------- Maybid	Favorable--------	Low strength, compressible, hard to pack.	Favorable--------	Wetness, percs slowly, poor outlets.	Wetness, percs slowly.
MC*, MD*. Medisaprists					
MeB---------- Melrose	Slope----------	Low strength, hard to pack, shrink-swell.	No water---------	Not needed--------	Slope, percs slowly.
MmA, MmB, MmC, MmD---------- Merrimac	Slope, seepage.	Seepage----------	No water---------	Not needed--------	Slope, droughty.
MoB, MoC, MoD----- Montauk	Slope, seepage.	Piping----------	No water---------	Not needed--------	Percs slowly, slope, erodes easily.
MsB, MsC, MsD, MxC---------- Montauk	Slope----------	Large stones, piping.	No water---------	Not needed--------	Large stones, percs slowly, slope.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Grassed waterways
NnA, NnB---------- Ninigret	Slope, seepage.	Seepage, piping.	Deep to water----	Wetness, slope.	Slope, wetness.
PaB, PaC, PaD----- Paxton	Favorable, slope.	Favorable--------	No water---------	Not needed--------	Percs slowly, slope, erodes easily.
PbB, PbC, PbD, PcC, PcD, PcE---- Paxton	Favorable, slope.	Large stones-----	No water---------	Not needed--------	Large stones, percs slowly.
Pe---------- Pipestone	Seepage---------	Seepage, piping, wetness.	Favorable--------	Favorable---------	Droughty, wetness.
Pg*. Pits, gravel					
Qu*. Quarries					
Ra---------- Raynham	Favorable--------	Piping, low strength, erodes easily.	Favorable--------	Wetness, percs slowly.	Wetness, percs slowly, erodes easily.
RdA, RdB---------- Ridgebury	Slope------------	Favorable--------	Slow refill------	Wetness, percs slowly, poor outlets.	Wetness, percs slowly.
RlA*, RlB*: Ridgebury--------	Slope------------	Large stones-----	Large stones-----	Wetness, percs slowly.	Wetness, large stones, percs slowly.
Leicester--------	Seepage, slope.	Seepage, large stones.	Large stones-----	Wetness----------	Wetness, large stones.
RnC*, RnD*: Rock outcrop.					
Buxton----------	Percs slowly, wetness.	Piping, erodes easily.	Slow refill------	Percs slowly------	Percs slowly, erodes easily.
RoC*, RoD*: Rock outcrop.					
Charlton---------	Seepage, slope.	Seepage, large stones.	No water---------	Not needed--------	Large stones, slope, erodes easily.
Hollis----------	Slope, depth to rock, seepage.	Thin layer, piping, seepage.	No water, depth to rock.	Not needed--------	Slope, droughty, rooting depth.
Rx*: Rock outcrop.					
Hollis----------	Slope, depth to rock, seepage.	Thin layer, piping, seepage.	No water, depth to rock.	Not needed--------	Slope, droughty, rooting depth.
Sa---------- Saco Variant	Seepage----------	Wetness----------	Favorable--------	Floods, frost action.	Wetness.
ScA, ScB---------- Scantic	Favorable--------	Hard to pack, wetness.	Slow refill------	Percs slowly, frost action, slope.	Wetness, percs slowly, erodes easily.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Grassed waterways
Se---------- Scarboro	Seepage----------	Hard to pack, seepage.	Favorable--------	Cutbanks cave, wetness.	Wetness.
SgB, SgC---------- Scituate	Slope----------	Piping----------	Deep to water----	Percs slowly, slope.	Percs slowly, slope.
ShB, ShC---------- Scituate	Slope----------	Piping, large stones.	Deep to water, large stones.	Percs slowly, slope.	Percs slowly, slope, large stones.
SrA, SrB---------- Sudbury	Slope, seepage.	Piping, seepage.	Deep to water----	Favorable---------	Wetness, slope.
SsB, SsC---------- Suffield	Slope----------	Piping, erodes easily, low strength.	No water, slow refill.	Not needed--------	Erodes easily, percs slowly, slope.
StA, StB, StC----- Sutton	Slope, seepage.	Seepage----------	Deep to water----	Wetness----------	Slope, wetness.
SuB, SuC---------- Sutton	Slope, seepage.	Large stones, seepage.	Deep to water, large stones.	Wetness----------	Slope, wetness, large stones.
SwA, SwB---------- Swanton	Favorable--------	Wetness, hard to pack.	Favorable--------	Percs slowly, frost action, slope.	Wetness, percs slowly.
UAC*. Udipsamments					
UD*. Udorthents					
UnA, UnB, UnC----- Unadilla	Seepage----------	Low strength, piping, seepage.	Deep to water----	Not needed--------	Erodes easily.
Ur*. Urban land					
WaA, WaB---------- Walpole.	Seepage----------	Piping, seepage.	Favorable--------	Wetness----------	Wetness.
Wb---------- Walpole Variant	Seepage----------	Wetness----------	Favorable--------	Frost action------	Wetness.
WeA, WeB---------- Wareham	Seepage----------	Piping, seepage.	Favorable--------	Cutbanks cave, wetness, poor outlets.	Wetness.
Wf---------- Whately Variant	Seepage----------	Seepage----------	Favorable--------	Percs slowly, frost action.	Wetness.
Wg---------- Whitman	Favorable--------	Piping----------	Favorable--------	Wetness, percs slowly, poor outlets.	Wetness, percs slowly.
Wh---------- Whitman	Favorable--------	Large stones, piping.	Large stones-----	Wetness, percs slowly, poor outlets.	Large stones, wetness, percs slowly.
WnA, WnB, WnC, WnD---------- Windsor	Seepage, slope.	Seepage, piping.	No water---------	Not needed--------	Droughty, slope.
WoC*, WoD*: Windsor----------	Seepage, slope.	Seepage, piping.	No water---------	Not needed--------	Droughty, slope.
Rock outcrop.					

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Grassed waterways
Wp---------- Winooski	Seepage----------	Piping, erodes easily.	Deep to water----	Floods, poor outlets.	Not needed.
WrA, WrB, WrC----- Woodbridge	Slope----------	Favorable--------	Deep to water----	Percs slowly, slope.	Percs slowly, slope.
WsB, WsC, WsD, WtB, WtC--------- Woodbridge	Slope, large stones.	Large stones-----	Deep to water, large stones.	Percs slowly, slope, large stones.	Percs slowly, slope, large stones.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AgA Agawam	Slight	Slight	Slight	Slight	Slight.
AgB Agawam	Slight	Slight	Moderate: slope.	Slight	Slight.
AgC Agawam	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
AmA Amostown	Slight	Slight	Moderate: wetness.	Slight	Slight.
AmB Amostown	Slight	Slight	Moderate: slope, wetness.	Slight	Slight.
Ba*. Beaches					
BeA Belgrade	Slight	Slight	Moderate: wetness.	Slight	Slight.
BeB Belgrade	Slight	Slight	Moderate: slope, wetness.	Slight	Slight.
BeC Belgrade	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Br Birdsall	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
BuA, BuB Buxton	Severe: percs slowly.	Moderate: wetness.	Severe: percs slowly.	Slight	Moderate: wetness.
BuC Buxton	Severe: percs slowly.	Moderate: slope, wetness.	Severe: slope, percs slowly.	Slight	Moderate: slope, wetness.
BxB*: Buxton	Severe: percs slowly.	Moderate: wetness.	Severe: percs slowly.	Slight	Moderate: wetness.
Rock outcrop.					
BxC*: Buxton	Severe: percs slowly.	Moderate: slope, wetness.	Severe: slope, percs slowly.	Slight	Moderate: slope, wetness.
Rock outcrop.					
CaA Canton	Slight	Slight	Moderate: small stones.	Slight	Slight.
CaB Canton	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
CaC Canton	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
CaD Canton	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.

See footnote at end of table.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
CbB--Canton	Moderate: large stones.	Slight	Moderate: slope, large stones.	Moderate: large stones.	Moderate: large stones.
CbC--Canton	Moderate: slope, large stones.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Moderate: large stones.
CbD--Canton	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope, large stones.	Severe: slope.
CcB--Canton	Severe: large stones.	Moderate: large stones.	Severe: large stones.	Severe: large stones.	Severe: large stones.
CcC--Canton	Severe: large stones.	Moderate: slope, large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.
CcD--Canton	Severe: slope, large stones.	Severe: slope.	Severe: slope, large stones.	Severe: large stones.	Severe: slope, large stones.
CDE*:					
Canton	Severe: slope, large stones.	Severe: slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
Charlton	Severe: large stones, slope.	Severe: slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
CeA--Carver	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Severe: too sandy.
CeB--Carver	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Severe: too sandy.
CmB--Charlton	Slight	Slight	Moderate: slope.	Slight	Slight.
CmC--Charlton	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
CmD--Charlton	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
CoB--Charlton	Moderate: large stones.	Slight	Moderate: slope, large stones.	Moderate: large stones.	Moderate: large stones.
CoC--Charlton	Moderate: slope, large stones.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Moderate: slope, large stones.
CoD--Charlton	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope, large stones.	Severe: slope.
CrB*:					
Charlton	Moderate: large stones.	Slight	Moderate: slope, large stones.	Moderate: large stones.	Moderate: large stones.
Rock outcrop.					

See footnote at end of table.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
CrB*:					
Hollis	Moderate: large stones.	Slight	Severe: depth to rock.	Slight	Severe: depth to rock.
CrC*:					
Charlton	Moderate: slope, large stones.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Moderate: slope, large stones.
Rock outcrop.					
Hollis	Moderate: slope, large stones.	Moderate: slope.	Severe: slope, depth to rock.	Slight	Severe: depth to rock.
CrD*:					
Charlton	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope, large stones.	Severe: slope.
Rock outcrop.					
Hollis	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Moderate: slope, large stones.	Severe: slope, depth to rock.
De Deerfield	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Severe: too sandy.
Du*. Dumps					
ElA Elmwood	Moderate: percs slowly.	Slight	Moderate: percs slowly.	Slight	Slight.
ElB Elmwood	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly.	Slight	Slight.
Ha Hadley	Severe: floods.	Moderate: floods.	Moderate: floods.	Slight	Moderate: floods.
HfA, HfB Hinckley	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.
HfC Hinckley	Moderate: too sandy, slope.	Moderate: too sandy, slope.	Severe: slope.	Moderate: too sandy.	Moderate: slope, too sandy.
HfD Hinckley	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too sandy.	Severe: slope.
HWE*:					
Hinckley	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Windsor	Severe: slope.	Severe: slope.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy, droughty.
IW*:					
Ipswich	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, excess salt, floods.

See footnote at end of table.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
IW*: Westbrook	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess salt.
LeA, LeB: Leicester	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Lr*: Limerick	Severe: floods, wetness.	Severe: wetness.	Severe: wetness, floods.	Severe: wetness.	Severe: floods, wetness.
Rumney	Severe: floods, wetness.	Severe: wetness.	Severe: wetness, floods.	Severe: wetness.	Severe: floods, wetness.
Ma: Maybid	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
MC*, MD*. Medisaprists					
MeB: Melrose	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly.	Slight	Slight.
MmA: Merrimac	Slight	Slight	Slight	Slight	Slight.
MmB: Merrimac	Slight	Slight	Moderate: slope.	Slight	Slight.
MmC: Merrimac	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
MmD: Merrimac	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
MoB: Montauk	Slight	Slight	Moderate: slope.	Slight	Slight.
MoC: Montauk	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
MoD: Montauk	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
MsB: Montauk	Moderate: large stones, percs slowly.	Slight	Severe: small stones.	Moderate: large stones.	Moderate: large stones.
MsC: Montauk	Moderate: slope, large stones.	Moderate: slope.	Severe: slope, large stones.	Moderate: large stones.	Moderate: slope, large stones.
MsD: Montauk	Severe: slope.	Severe: slope, large stones.	Severe: slope, large stones.	Moderate: slope, large stones.	Severe: slope.
MxC: Montauk	Severe: large stones.	Moderate: slope, large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.
NnA: Ninigret	Slight	Slight	Moderate: wetness.	Slight	Slight.

See footnote at end of table.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
NnB---------- Ninigret	Slight----------	Slight----------	Moderate: slope, wetness.	Slight----------	Slight.
PaB---------- Paxton	Moderate: percs slowly.	Slight----------	Moderate: percs slowly.	Slight----------	Moderate: small stones.
PaC---------- Paxton	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: small stones.
PaD---------- Paxton	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
PbB---------- Paxton	Moderate: percs slowly.	Slight----------	Moderate: percs slowly.	Moderate: large stones.	Moderate: large stones.
PbC---------- Paxton	Moderate: percs slowly, slope.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Moderate: large stones.
PbD---------- Paxton	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: large stones, slope.	Severe: slope.
PcC---------- Paxton	Severe: large stones.	Moderate: large stones, slope.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.
PcD---------- Paxton	Severe: slope, large stones.	Severe: slope.	Severe: slope, large stones.	Severe: large stones.	Severe: slope, large stones.
PcE---------- Paxton	Severe: slope, large stones.	Severe: slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
Pe---------- Pipestone	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness, too sandy.	Severe: wetness.
Pg*. Pits, gravel					
Qu*. Quarries					
Ra---------- Raynham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.
RdA, RdB---------- Ridgebury	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
RlA*, RlB*: Ridgebury----------	Severe: wetness, large stones.	Severe: wetness, large stones.	Severe: large stones, wetness.	Severe: wetness, large stones.	Severe: large stones, wetness.
Leicester----------	Severe: large stones, wetness.	Severe: large stones, wetness.	Severe: large stones, wetness.	Severe: large stones, wetness.	Severe: large stones, wetness.
RnC*: Rock outcrop.					
Buxton----------	Severe: percs slowly.	Moderate: slope, wetness.	Severe: slope, percs slowly.	Slight----------	Moderate: slope, wetness.

See footnote at end of table.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
RnD*: Rock outcrop.					
Buxton	Severe: slope, percs slowly.	Severe: slope.	Severe: slope, percs slowly.	Moderate: slope.	Severe: slope.
RoC*: Rock outcrop.					
Charlton	Moderate: slope, large stones.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Moderate: slope, large stones.
Hollis	Moderate: slope, large stones.	Moderate: slope.	Severe: slope, depth to rock.	Moderate: large stones.	Severe: depth to rock.
RoD*: Rock outcrop.					
Charlton	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope, large stones.	Severe: slope.
Hollis	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Moderate: slope, large stones.	Severe: slope, depth to rock.
Rx*: Rock outcrop.					
Hollis	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
Sa Saco Variant	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: wetness.	Severe: floods, wetness.
ScA, ScB Scantic	Severe: wetness.	Severe: wetness.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
Se Scarboro	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
SgB Scituate	Moderate: percs slowly.	Slight	Moderate: percs slowly.	Slight	Slight.
SgC Scituate	Moderate: percs slowly.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
ShB Scituate	Moderate: large stones.	Slight	Moderate: percs slowly.	Moderate: large stones.	Slight.
ShC Scituate	Moderate: large stones.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Moderate: slope.
SrA Sudbury	Slight	Slight	Moderate: wetness.	Slight	Slight.
SrB Sudbury	Slight	Slight	Moderate: slope, wetness.	Slight	Slight.
SsB Suffield	Severe: percs slowly.	Slight	Severe: percs slowly.	Slight	Slight.

See footnote at end of table.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
SsC---------- Suffield	Severe: percs slowly.	Moderate: slope.	Severe: slope, percs slowly.	Slight----------	Moderate: slope.
StA---------- Sutton	Slight----------	Slight----------	Slight----------	Slight----------	Slight
StB---------- Sutton	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
StC---------- Sutton	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
SuB---------- Sutton	Moderate: large stones.	Slight----------	Moderate: slope, large stones.	Moderate: large stones.	Moderate: large stones.
SuC---------- Sutton	Moderate: slope, large stones.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Moderate: slope, large stones.
SwA, SwB---------- Swanton	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.
UAC*. Udipsamments					
UD*. Udorthents					
UnA, UnB---------- Unadilla	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
UnC---------- Unadilla	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
Ur*. Urban land					
WaA, WaB---------- Walpole	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Wb---------- Walpole Variant	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
WeA, WeB---------- Wareham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, too sandy.
Wf---------- Whately Variant	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Wg---------- Whitman	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Wh---------- Whitman	Severe: wetness, large stones.	Severe: wetness, large stones.	Severe: wetness, large stones.	Severe: wetness, large stones.	Severe: large stones, wetness.
WnA, WnB---------- Windsor	Moderate: too sandy.	Moderate: too sandy.	Severe: too sandy.	Moderate: too sandy.	Severe: too sandy, droughty.
WnC---------- Windsor	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope, too sandy.	Moderate: too sandy.	Severe: too sandy, droughty.

See footnote at end of table.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
WnD---------- Windsor	Severe: slope.	Severe: slope.	Severe: slope, too sandy.	Moderate: too sandy.	Severe: slope, too sandy, droughty.
WoC*: Windsor----------	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope, too sandy.	Moderate: too sandy.	Severe: too sandy, droughty.
Rock outcrop.					
WoD*: Windsor----------	Severe: slope.	Severe: slope.	Severe: slope, too sandy.	Moderate: too sandy.	Severe: slope, too sandy, droughty.
Rock outcrop.					
Wp---------- Winooski	Severe: floods.	Moderate: floods.	Moderate: floods.	Slight----------	Moderate: floods.
WrA, WrB---------- Woodbridge	Moderate: percs slowly.	Slight----------	Moderate: percs slowly.	Slight----------	Slight.
WrC---------- Woodbridge	Moderate: percs slowly, slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
WsB---------- Woodbridge	Moderate: percs slowly.	Slight----------	Moderate: percs slowly, slope.	Moderate: large stones.	Moderate: large stones.
WsC---------- Woodbridge	Moderate: percs slowly, slope.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Moderate: large stones.
WsD---------- Woodbridge	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: large stones, slope.	Severe: slope, large stones.
WtB---------- Woodbridge	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: large stones.
WtC---------- Woodbridge	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--WILDLIFE HABITAT POTENTIALS

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
AgA---- Agawam	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
AgB---- Agawam	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
AgC---- Agawam	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
AmA---- Amostown	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
AmB---- Amostown	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
Ba*. Beaches										
BeA---- Belgrade	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
BeB---- Belgrade	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
BeC---- Belgrade	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
Br---- Birdsall	Very poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good
BuA---- Buxton	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
BuB---- Buxton	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
BuC---- Buxton	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
BxB*: Buxton----	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
Rock outcrop.										
BxC*: Buxton----	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
Rock outcrop.										
CaA---- Canton	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
CaB---- Canton	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
CaC---- Canton	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
CaD---- Canton	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor

See footnote at end of table.

TABLE 13.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
CbB---- Canton	Very poor	Poor	Good	Good	Good	Poor	Very poor	Poor	Good	Very poor
CbC, CbD---- Canton	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor
CcB---- Canton	Very poor	Very poor	Good	Good	Good	Poor	Very poor	Poor	Fair	Very poor
CcC, CcD---- Canton	Very poor	Very poor	Good	Good	Good	Very poor	Very poor	Poor	Fair	Very poor
CDE*:										
Canton----	Very poor	Very poor	Good	Good	Good	Very poor	Very poor	Poor	Fair	Very poor
Charlton----	Very poor	Very poor	Good	Good	Good	Very poor	Very poor	Poor	Fair	Very poor
CeA, CeB---- Carver	Poor	Poor	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
CmB---- Charlton	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
CmC---- Charlton	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
CmD---- Charlton	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
CoB---- Charlton	Very poor	Poor	Good	Good	Good	Poor	Very poor	Poor	Good	Very poor
CoC, CoD---- Charlton	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor
CrB*:										
Charlton----	Very poor	Poor	Good	Good	Good	Poor	Very poor	Poor	Good	Very poor
Rock outcrop.										
Hollis----	Very poor	Poor	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
CrC*, CrD*:										
Charlton----	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor
Rock outcrop										
Hollis----	Very poor	Poor	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
De---- Deerfield	Poor	Fair	Fair	Poor	Poor	Poor	Poor	Fair	Poor	Poor
Du*. Dumps										
ElA---- Elmwood	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
ElB---- Elmwood	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor

See footnote at end of table.

TABLE 13.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Ha---------- Hadley	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
HfA, HfB, HfC, HfD- Hinckley	Poor	Poor	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
HWE*:										
Hinckley----------	Very poor	Poor	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
Windsor----------	Very poor	Poor	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
IW*:										
Ipswich----------	Very poor	Very poor	Very poor	Very poor	Very poor	Good	Good	Very poor	Very poor	Good
Westbrook---------	Very poor	Very poor	Very poor	Very poor	Very poor	Good	Good	Very poor	Very poor	Good
LeA---------- Leicester	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
LeB---------- Leicester	Poor	Fair	Fair	Fair	Fair	Poor	Very poor	Fair	Fair	Very poor
Lr*:										
Limerick----------	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
Rumney----------	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
Ma---------- Maybid	Very poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good
MC*, MD*. Medisaprists										
MeB---------- Melrose	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
MmA, MmB, MmC------ Merrimac	Fair	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
MmD---------- Merrimac	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
MoB---------- Montauk	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
MoC---------- Montauk	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
MoD---------- Montauk	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
MsB---------- Montauk	Very poor	Poor	Good	Good	Good	Poor	Very poor	Poor	Good	Very poor
MsC, MsD---------- Montauk	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor
MxC---------- Montauk	Very poor	Very poor	Good	Good	Good	Very poor	Very poor	Poor	Fair	Very poor
NnA---------- Ninigret	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor

See footnote at end of table.

TABLE 13.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
NnB---------- Ninigret	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
PaB---------- Paxton	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
PaC, PaD---------- Paxton	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
PbB---------- Paxton	Very poor	Poor	Good	Good	Good	Poor	Very poor	Poor	Good	Very poor
PbC, PbD---------- Paxton	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor
PcC, PcD, PcE------ Paxton	Very poor	Very poor	Good	Good	Good	Very poor	Very poor	Poor	Fair	Very poor
Pe---------- Pipestone	Fair	Poor	Fair	Poor	Poor	Poor	Fair	Poor	Poor	Poor
Pg*. Pits, gravel										
Qu*. Quarries										
Ra---------- Raynham	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
RdA---------- Ridgebury	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair
RdB---------- Ridgebury	Poor	Fair	Fair	Fair	Fair	Poor	Very poor	Fair	Fair	Very poor
RlA*:										
Ridgebury---------	Very poor	Very poor	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair
Leicester---------	Very poor	Very poor	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair
RlB*:										
Ridgebury---------	Very poor	Very poor	Fair	Fair	Fair	Poor	Very poor	Poor	Fair	Very poor
Leicester---------	Very poor	Very poor	Fair	Fair	Fair	Poor	Very poor	Poor	Fair	Very poor
RnC*:										
Rock outcrop.										
Buxton----------	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
RnD*:										
Rock outcrop.										
Buxton----------	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
RoC*, RoD*:										
Rock outcrop.										
Charlton----------	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor

See footnote at end of table.

TABLE 13.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
RoC*, RoD*: Hollis	Very poor	Poor	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
Rx*: Rock outcrop.										
Hollis	Very poor	Poor	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
Sa Saco Variant	Very poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good
ScA Scantic	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair
ScB Scantic	Poor	Fair	Fair	Fair	Fair	Poor	Very poor	Fair	Fair	Very poor
Se Scarboro	Very poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good
SgB Scituate	Fair	Good	Good	Fair	Fair	Poor	Very poor	Good	Fair	Very poor
SgC Scituate	Fair	Good	Good	Fair	Fair	Poor	Very poor	Good	Fair	Very poor
ShB Scituate	Very poor	Poor	Good	Fair	Fair	Poor	Very poor	Poor	Fair	Very poor
ShC Scituate	Very poor	Poor	Good	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor
SrA Sudbury	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
SrB Sudbury	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
SsB Suffield	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
SsC Suffield	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
StA Sutton	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
StB Sutton	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
StC Sutton	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
SuB Sutton	Very poor	Poor	Good	Good	Good	Poor	Very poor	Poor	Good	Very poor
SuC Sutton	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor
SwA Swanton	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair
SwB Swanton	Poor	Fair	Fair	Fair	Fair	Poor	Very poor	Fair	Fair	Very poor

See footnote at end of table.

TABLE 13.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
UAC*. Udipsamments										
UD*. Udorthents										
UnA, UnB---------- Unadilla	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
UnC---------- Unadilla	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
Ur*. Urban land										
WaA---------- Walpole	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
WaB---------- Walpole	Poor	Fair	Fair	Fair	Fair	Poor	Very poor	Fair	Fair	Very poor
Wb---------- Walpole Variant	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
WeA---------- Wareham	Poor	Fair	Fair	Poor	Poor	Fair	Fair	Fair	Poor	Fair
WeB---------- Wareham	Poor	Fair	Fair	Poor	Poor	Poor	Very poor	Fair	Poor	Very poor
Wf---------- Whately Variant	Very poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good
Wg---------- Whitman	Very poor	Poor	Poor	Poor	Poor	Good	Fair	Poor	Poor	Fair
Wh---------- Whitman	Very poor	Very poor	Poor	Poor	Poor	Good	Fair	Very poor	Poor	Fair
WnA, WnB, WnC, WnD- Windsor	Poor	Poor	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
WoC*, WoD*: Windsor----------	Poor	Poor	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
Rock outcrop.										
Wp---------- Winooski	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
WrA---------- Woodbridge	Fair	Good	Good	Fair	Fair	Poor	Poor	Good	Fair	Poor
WrB---------- Woodbridge	Fair	Good	Good	Fair	Fair	Poor	Very poor	Good	Fair	Very poor
WrC---------- Woodbridge	Fair	Good	Good	Fair	Fair	Very poor	Very poor	Good	Fair	Very poor
WsB---------- Woodbridge	Very poor	Poor	Good	Fair	Fair	Poor	Very poor	Poor	Fair	Very poor
WsC, WsD---------- Woodbridge	Very poor	Poor	Good	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor

See footnote at end of table.

TABLE 13.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
WtB---------- Woodbridge	Very poor.	Very poor.	Good	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
WtC---------- Woodbridge	Very poor.	Very poor.	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated. NP = nonplastic]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
AgA, AgB, AgC------ Agawam	0-9	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	85-100	40-65	---	---
	9-30	Fine sandy loam	SM, SP-SM	A-2, A-3, A-4	0	90-100	85-100	75-95	5-45	---	---
	30-60	Fine sand, loamy fine sand, loamy sand.	SM, SP-SM	A-2, A-4 A-3	0	90-100	85-100	70-90	5-35	---	---
AmA, AmB---------- Amostown	0-11	Fine sandy loam	SM, ML	A-2, A-4	0	95-100	90-100	55-95	30-70	---	NP
	11-38	Fine sandy loam, sandy loam.	SM	A-2, A-4	0	85-100	80-100	50-85	25-50	---	NP
	38-60	Stratified fine sand to silt.	ML, SM	A-4, A-2	0	100	100	65-100	25-90	---	NP
Ba*. Beaches											
BeA, BeB, BeC------ Belgrade	0-9	Very fine sandy loam.	ML, CL	A-4	0	100	95-100	90-100	55-90	<40	NP-8
	9-30	Silt loam, very fine sandy loam.	ML, CL	A-4	0	100	95-100	90-100	55-90	<40	NP-8
	30-60	Silt loam, very fine sandy loam.	ML, CL	A-4	0	100	95-100	90-100	50-90	<40	NP-8
Br---------- Birdsall	0-8	Silt loam-------	ML, OL, CL-ML	A-4	0	100	100	90-100	70-90	<30	NP-7
	8-25	Silt loam, very fine sandy loam.	ML, CL-ML	A-4	0	100	95-100	90-100	70-90	<30	NP-7
	25-60	Stratified silt to very fine sand.	ML, CL-ML	A-4	0	100	95-100	90-100	70-90	<30	NP-7
BuA, BuB, BuC------ Buxton	0-10	Silt loam-------	ML, CL	A-4, A-6, A-7	0	100	100	95-100	80-90	36-51	5-15
	10-30	Silt loam, silty clay loam.	ML, CL	A-4, A-6,	0	100	100	95-100	80-95	25-30	3-11
	30-60	Silty clay, silty clay loam, clay.	CL, ML	A-6, A-4	0	100	100	95-100	80-95	25-36	5-15
BxB*, BxC*: Buxton----------	0-10	Silt loam-------	ML, CL	A-4, A-6, A-7	0	100	100	95-100	80-90	36-51	5-15
	10-22	Silt loam, silty clay loam.	ML, CL	A-4, A-6,	0	100	100	95-100	80-95	25-30	3-11
	22-60	Silty clay, silty clay loam, clay.	CL, ML	A-6, A-4	0	100	100	95-100	80-95	25-36	5-15
Rock outcrop.											

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
CaA, CaB, CaC, CaD Canton	0-7	Fine sandy loam	SM, ML	A-2, A-4	0-5	85-100	70-95	40-90	25-70	<18	NP
	7-33	Fine sandy loam, loam, very fine sandy loam.	SM, ML	A-2, A-4	0-15	80-100	65-95	45-90	25-70	<12	NP
	33-60	Gravelly loamy sand, loamy fine sand, gravelly loamy coarse sand.	SM, SP-SM	A-1, A-2, A-3	5-30	75-95	50-85	20-80	5-25	<10	NP
CbB, CbC, CbD------ Canton	0-6	Very stony fine sandy loam.	SM, ML	A-2, A-4	5-25	80-100	65-95	45-90	25-70	<18	NP
	6-33	Fine sandy loam, loam, very fine sandy loam.	SM, ML	A-2, A-4	0-15	80-100	65-95	45-90	25-70	<12	NP
	33-60	Gravelly loamy sand, loamy fine sand, gravelly loamy coarse sand.	SM, SP-SM	A-1, A-2, A-3	5-30	75-95	50-85	20-80	5-25	<10	NP
CcB, CcC, CcD------ Canton	0-3	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	15-30	80-95	60-90	40-85	25-70	<15	NP
	3-33	Fine sandy loam, loam, very fine sandy loam.	SM, ML	A-2, A-4	0-15	80-100	65-95	45-90	25-70	<12	NP
	33-60	Gravelly loamy sand, loamy fine sand, gravelly loamy coarse sand.	SM, SP-SM	A-1, A-2, A-3	5-30	75-95	50-85	20-80	5-25	<10	NP
CDE*:											
Canton----------	0-3	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	15-30	80-95	60-90	40-85	25-70	<15	NP
	3-25	Fine sandy loam, loam, very fine sandy loam.	SM, ML	A-2, A-4	0-15	80-100	65-95	45-90	25-70	<12	NP
	25-60	Gravelly loamy sand, loamy fine sand, gravelly loamy coarse sand.	SM, SP-SM	A-1, A-2, A-3	5-30	75-95	50-85	20-80	5-25	<10	NP
Charlton----------	0-4	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	15-35	75-95	70-90	60-85	30-70	---	NP-5
	4-28	Fine sandy loam, gravelly fine sandy loam, gravelly loam.	SM, ML	A-2, A-4	5-15	65-90	60-90	50-80	20-65	---	NP-3
	28-60	Loam, gravelly fine sandy loam gravelly sandy loam.	SM	A-2, A-4	5-15	60-90	60-85	50-70	20-45	---	NP
CeA, CeB---------- Carver	0-5	Loamy coarse sand.	SM	A-2	0	95-100	95-100	60-65	15-30	<35	NP
	5-34	Coarse sand, loamy sand, loamy coarse sand.	SM, SP-SM	A-2, A-1 A-3	0	75-100	70-100	35-70	5-25	<35	NP
	34-60	Coarse sand-----	SP-SM	A-2, A-1	0	75-100	70-100	30-50	5-10	<35	NP

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
CmB, CmC, CmD----- Charlton	0-4	Fine sandy loam	SM, ML	A-2, A-4	5-10	75-95	70-90	60-85	30-70	---	NP-5
	4-28	Fine sandy loam, gravelly fine sandy loam, gravelly loam.	SM, ML	A-2, A-4	5-15	65-90	60-90	50-80	20-65	---	NP-3
	28-60	Gravelly sandy loam, gravelly fine sandy loam, loam.	SM	A-2, A-4	5-15	60-90	60-85	50-70	20-45	---	NP
CoB, CoC, CoD----- Charlton	0-4	Very stony fine sandy loam.	SM, ML	A-2, A-4	10-30	75-95	70-90	60-85	30-70	---	NP-5
	4-28	Fine sandy loam, gravelly fine sandy loam, gravelly loam.	SM, ML	A-2, A-4	5-15	65-90	60-90	50-80	20-65	---	NP-3
	28-60	Loam, gravelly fine sandy loam gravelly sandy loam.	SM	A-2, A-4	5-15	60-90	60-85	50-70	20-45	---	NP
CrB*, CrC*, CrD*: Charlton----------	0-4	Very stony fine sandy loam.	SM, ML	A-2, A-4	10-30	75-95	70-90	60-85	30-70	---	NP-5
	4-28	Fine sandy loam, gravelly fine sandy loam, gravelly loam.	SM, ML	A-2, A-4	5-15	65-90	60-90	50-80	20-65	---	NP-3
	28-60	Loam, gravelly fine sandy loam gravelly sandy loam.	SM	A-2, A-4	5-15	60-90	60-85	50-70	20-45	---	NP
Rock outcrop.											
Hollis----------	0-5	Fine sandy loam	SM, ML	A-2, A-4	0-15	75-100	65-95	40-85	25-70	<20	NP-3
	5-16	Fine sandy loam, sandy loam, gravelly loam.	SM, ML	A-2, A-4	0-15	75-95	65-95	40-80	20-65	---	NP
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
De---------- Deerfield	0-9	Loamy fine sand	SP-SM, SM	A-1, A-2, A-3	0	95-100	80-100	40-75	5-30	---	NP
	9-25	Loamy sand, sand, coarse sand.	SM, SP-SM	A-1, A-2, A-3	0	95-100	80-100	40-75	5-30	---	NP
	25-60	Sand, fine sand, coarse sand.	SP, SM, SP-SM	A-1, A-2, A-3	0	95-100	65-100	30-75	3-30	---	NP
Du*. Dumps											
ElA, ElB---------- Elmwood	0-1	Fine sandy loam	SM, ML	A-2, A-4	0	100	95-100	55-85	30-55	<33	NP
	1-35	Sandy loam, fine sandy loam, silt loam.	SM, ML	A-2, A-4	0	100	95-100	55-95	30-75	35-45	NP
	35-60	Silty clay loam, clay loam, clay.	CL, CH	A-7, A-6	0	100	100	90-100	70-95	35-60	15-45

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Ha Hadley	0-9	Very fine sandy loam.	ML, CL-ML, CL	A-4	0	100	95-100	95-100	70-95	<30	NP-9
	9-56	Silt loam, very fine sandy loam, very fine sand.	ML, CL-ML	A-4	0	100	95-100	90-100	60-95	<30	NP-7
	56-60	Silt loam, sandy loam, sand.	ML, CL-ML, SM	A-4	0	100	95-100	75-95	40-85	<30	NP-7
HfA, HfB, HfC, HfD Hinckley	0-7	Loamy sand------	SM, ML, SP-SM,	A-1, A-2, A-4	0-20	60-95	40-85	20-80	6-55	---	NP
	7-19	Gravelly loamy sand, loamy fine sand, very gravelly loamy coarse sand.	SM, GM, GP-GM	A-1, A-2 A-3	0-20	50-95	30-85	15-70	2-30	---	NP
	19-60	Stratified gravelly loamy fine sand to very cobbly coarse sand.	SP, SP-SM, GP, GP-GM, SM	A-1	0-45	40-75	20-50	10-40	0-20	---	NP
HWE*:											
Hinckley----------	0-3	Loamy sand------	SM, ML, SP-SM	A-1, A-2, A-4	0-20	60-95	40-85	20-80	6-55	---	NP
	3-15	Gravelly loamy sand, loamy fine sand, very gravelly loamy coarse sand.	SM, GM, GP-GM	A-1, A-2 A-3	0-20	50-95	30-85	15-70	2-30	---	NP
	15-60	Stratified gravelly loamy fine sand to very cobbly coarse sand.	SP, SP-SM, GP, GP-GM, SM	A-1	0-45	40-75	20-50	10-40	0-20	---	NP
Windsor----------	0-3	Loamy sand------	SM	A-2, A-1	0	95-100	85-100	35-85	20-35	---	NP
	3-17	Loamy sand, loamy fine sand, sand.	SP-SM, SM	A-2, A-1	0	95-100	85-100	45-95	10-30	---	NP
	17-60	Sand, fine sand	SP-SM, SM	A-2, A-3 A-1	0	90-100	75-100	40-95	5-20	---	NP
IW*:											
Ipswich----------	0-42	Hemic material	Pt	---	0	---	---	---	---	---	NP
	42-62	Sapric material, hemic material.	Pt	---	0	---	---	---	---	---	NP
Westbrook---------	0-45	Hemic material	Pt	---	0	---	---	---	---	---	NP
	45-60	Silt loam, very fine sandy loam.	ML, CL-ML, OL	A-4	0	95-100	95-100	95-100	85-100	<25	NP-5
LeA, LeB----------	0-5	Fine sandy loam	SM, ML	A-2, A-4	0-10	70-95	70-90	45-85	25-70	<25	NP-5
Leicester	5-28	Fine sandy loam, loam, gravelly sandy loam.	SM	A-2, A-4	5-10	70-90	60-85	40-75	25-50	---	NP
	28-60	Fine sandy loam, sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	65-90	55-85	35-70	20-45	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Lr*:											
Limerick	0-13	Silt loam	ML	A-4	0	100	100	95-100	80-95	15-30	NP
	13-42	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	80-95	15-30	NP
	42-60	Silt loam, very fine sand, coarse sand.	ML, SM, SP-SM	A-4, A-1 A-2	0	100	100	30-100	5-95	<25	NP
Rumney	0-5	Fine sandy loam	SM, ML	A-2, A-4	0	100	85-100	50-85	25-55	<40	NP
	5-29	Fine sandy loam, sandy loam, loam.	SM, ML	A-2, A-4	0	100	85-100	50-95	25-75	<40	NP
	29-60	Stratified loamy sand to gravelly sand.	SM, SP-SM	A-1, A-2, A-3	0	80-100	55-95	25-70	5-30	<40	NP
Ma Maybid	0-7	Silt loam	ML, CL, CH	A-4, A-6, A-7	0	100	100	90-100	75-95	30-52	4-26
	7-19	Silty clay, silty clay loam, clay.	CL, CH	A-6, A-7	0	100	100	95-100	85-95	30-52	10-26
	19-60	Silty clay loam, silty clay, clay.	CL, CH	A-6, A-7	0	100	100	95-100	85-95	30-52	10-26
MC*, MD*. Medisaprists											
MeB Melrose	0-4	Fine sandy loam	SM, ML	A-2, A-4	0	100	95-100	55-85	30-55	---	NP
	4-32	Fine sandy loam, coarse sandy loam, loamy sand.	SM	A-2, A-4	0	100	95-100	50-85	15-50	---	NP
	32-60	Silty clay loam, clay loam, clay.	CL, ML, CH	A-7, A-6	0	100	100	90-100	70-95	30-60	11-45
MmA, MmB, MmC, MmD Merrimac	0-18	Fine sandy loam	SM, ML	A-1, A-2 A-4	0	85-95	70-90	40-85	20-55	<20	NP
	18-26	Sandy loam	SM	A-2, A-1	0	75-95	70-90	40-60	20-35	<25	NP
	26-60	Stratified sand to very gravelly sand.	GP, SP, SP-SM, GP-GM	A-1	5-25	40-65	30-60	15-40	0-10	---	NP
MoB, MoC, MoD Montauk	0-2	Sandy loam	ML, SM	A-4, A-2, A-1	0	80-100	75-95	45-95	20-75	<20	NP-4
	2-30	Fine sandy loam, gravelly sandy loam, loam.	SM, ML	A-2, A-4, A-1	0-5	60-100	55-80	35-80	15-55	<20	NP-4
	30-60	Sandy loam, gravelly loamy sand.	SM, SP-SM, GM	A-2, A-1, A-4	0-5	45-100	55-95	30-70	5-40	<15	NP-2
MsB, MsC, MsD Montauk	0-2	Very stony sandy loam.	SM, ML	A-1, A-2, A-4	2-6	60-80	55-75	35-70	15-60	<20	NP-4
	2-30	Fine sandy loam, loam, gravelly sandy loam.	SM, ML	A-1, A-2, A-4	0-5	60-100	55-95	30-85	15-55	<20	NP-4
	30-60	Sandy loam, gravelly loamy sand.	SM, SP-SM, GM	A-1, A-2, A-4	0-5	45-100	55-95	30-70	5-40	<15	NP-2

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
MxC---------- Montauk	0-2	Extremely stony sandy loam.	SM, ML, GM	A-2, A-4, A-1	5-25	50-80	50-75	25-70	15-60	<20	NP-4
	2-30	Fine sandy loam, loam, gravelly sandy loam.	SM, ML	A-1, A-2, A-4	0-5	60-100	55-95	30-85	15-55	<20	NP-4
	30-60	Sandy loam, gravelly loamy sand.	SM, SP-SM, GM	A-1, A-2, A-4	0-5	45-100	55-95	30-70	5-40	<15	NP-2
NnA, NnB---------- Ninigret	0-9	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	70-95	40-65	<25	NP-3
	9-23	Fine sandy loam, sandy loam, loamy sand.	SM	A-2, A-4	0	95-100	90-100	65-85	20-50	---	NP
	23-60	Loamy sand, sand, gravelly sand.	SP, SM, GM	A-1, A-2, A-3	0-10	60-100	45-100	25-75	0-30	---	NP
PaB, PaC, PaD------ Paxton	0-6	Fine sandy loam	SM, ML	A-2, A-4	0-10	80-95	75-90	60-85	30-65	<30	NP-10
	6-21	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC	A-2, A-4	0-15	70-90	65-90	55-85	25-65	<30	NP-10
	21-60	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC	A-2, A-4	0-15	70-90	60-85	55-75	20-60	<30	NP-10
PbB, PbC, PbD------ Paxton	0-6	Very stony fine sandy loam.	SM, ML	A-2, A-4	5-20	80-95	75-90	60-85	30-65	<30	<10
	6-21	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC	A-2, A-4	5-20	70-90	65-90	55-85	25-65	<30	<10
	21-60	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC	A-2, A-4	5-15	70-90	60-85	55-75	20-60	<30	<10
PcC, PcD, PcE------ Paxton	0-4	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	10-25	80-90	70-85	60-80	30-65	<30	<10
	4-21	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC	A-2, A-4	5-20	70-90	65-90	55-85	25-65	<30	<10
	21-60	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC	A-2, A-4	5-15	70-90	60-85	55-75	20-60	<30	<10
Pe---------- Pipestone	0-8	Loamy sand------	SP, SM, SP-SM	A-2 A-3	0	95-100	90-100	60-80	0-20	---	NP
	8-21	Sand, loamy sand, fine sand.	SP-SM, SP, SM	A-2 A-3	0	95-100	90-100	60-80	0-15	---	NP
	21-60	Sand, fine sand	SP-SM, SP	A-3, A-2	0	95-100	90-100	50-80	0-10	---	NP
Pg*. Pits, gravel											
Qu*. Quarries											
Ra---------- Raynham	0-10	Silt loam-------	ML, CL-ML	A-4	0	100	95-100	80-100	55-95	20-35	NP-10
	10-36	Silt loam, very fine sandy loam.	ML, CL-ML	A-4	0	100	95-100	80-100	55-95	20-35	NP-10
	36-60	Silt loam, very fine sandy loam, loamy very fine sand.	ML, CL-ML	A-4	0	100	95-100	80-100	55-95	20-35	NP-10

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
RdA, RdB---------- Ridgebury	0-9	Fine sandy loam	SM, ML	A-1, A-2, A-4	0-15	80-100	75-95	40-90	20-70	---	NP
	9-18	Sandy loam, gravelly loam, fine sandy loam	SM, ML	A-1, A-2, A-4	0-15	65-95	55-90	40-80	20-60	---	NP
	18-60	Sandy loam, gravelly loam, fine sandy loam	SM, ML	A-1, A-2, A-4	0-15	65-95	55-90	35-80	20-60	---	NP
RlA*, RlB*: Ridgebury---------	0-5	Extremely stony fine sandy loam	SM, ML	A-2, A-4	10-30	70-100	60-95	45-85	25-65	---	NP
	5-18	Sandy loam, gravelly loam, fine sandy loam	SM, ML	A-1, A-2, A-4	10-30	65-95	55-90	40-80	20-60	---	NP
	18-60	Sandy loam, gravelly loam, fine sandy loam	SM, ML	A-1, A-2, A-4	10-30	65-95	55-90	35-80	20-60	---	NP
Leicester---------	0-5	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	5-25	70-95	70-90	45-85	25-70	<25	NP-5
	5-28	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-10	70-90	60-85	40-75	20-50	---	NP
	28-60	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	65-90	55-85	35-70	20-45	---	NP
RnC*, RnD*: Rock outcrop.											
Buxton----------	0-4	Silt loam----------	ML, CL	A-4, A-6, A-7	0	100	100	95-100	80-90	36-51	5-15
	4-22	Silt loam, silty clay loam.	ML, CL	A-4, A-6	0	100	100	95-100	80-95	25-30	3-11
	22-60	Silty clay, silty clay loam, clay.	CL, ML	A-6 A-4	0	100	100	95-100	80-95	25-36	5-15
RoC*, RoD*: Rock outcrop.											
Charlton----------	0-4	Very stony fine sandy loam.	SM, ML	A-2, A-4	10-30	75-95	70-90	60-85	30-70	---	NP-5
	4-28	Loam, gravelly fine sandy loam, gravelly loam.	SM, ML	A-2, A-4	5-15	65-90	60-90	50-80	20-65	---	NP-3
	28-60	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	60-90	60-85	50-70	20-45	---	NP
Hollis----------	0-5	Fine sandy loam	SM, ML	A-2, A-4	0-15	75-100	65-95	40-85	25-70	<20	NP-3
	5-16	Fine sandy loam, sandy loam, gravelly loam.	SM, ML	A-2, A-4	0-15	75-95	65-95	40-80	20-65	---	NP
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Rx*: Rock outcrop.											
Hollis	0-5	Fine sandy loam	SM, ML	A-2, A-4	0-15	75-100	65-95	40-85	25-70	<20	NP-3
	5-16	Fine sandy loam, sandy loam, gravelly loam.	SM, ML	A-2, A-4	0-15	75-95	65-95	40-80	20-65	---	NP
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Sa Saco Variant	0-5	Silt loam	CL-ML, ML, OL	A-4	0	100	100	85-100	70-90	20-40	NP-10
	5-20	Silt loam, very fine sandy loam.	ML, CL-ML	A-4	0	100	100	95-100	70-90	20-40	NP-7
	20-60	Loamy fine sand, fine sand, sand.	SM	A-2	0	100	100	50-80	12-35	<20	NP
ScA, ScB Scantic	0-11	Silt loam	ML, MH, CL	A-4, A-6, A-7, A-5	0	100	95-100	90-100	70-95	30-62	5-25
	11-26	Silty clay loam, silt loam, clay.	CL, MH, CH, ML	A-7, A-6, A-4, A-5	0	100	95-100	90-100	75-100	24-54	6-27
	26-60	Clay, silty clay loam, silty clay.	CL, MH, ML	A-6, A-7, A-4, A-5	0	100	95-100	95-100	80-100	25-54	6-23
Se	0-5	Mucky fine sandy loam.	SM	A-2, A-4	0	90-100	80-100	65-95	25-50	---	NP
Scarboro	5-26	Loamy fine sand, loamy sand, sand.	SM, SP-SM	A-2, A-1	0	90-100	80-100	45-80	5-30	---	NP
	26-60	Loamy sand, sand fine sand.	SM, SP	A-1, A-2	0	85-100	70-100	35-80	0-35	---	NP
SgB, SgC Scituate	0-10	Fine sandy loam	SM, ML	A-2, A-4	0-5	85-100	75-95	45-90	25-70	---	NP
	10-27	Fine sandy loam, sandy loam, loam.	SM, ML	A-2, A-4	0-5	85-100	75-95	45-90	25-70	---	NP
	27-60	Loamy fine sand, gravelly loamy coarse sand.	SM	A-1, A-2, A-4	5-30	75-90	65-85	40-80	15-50	---	NP
ShB, ShC Scituate	0-5	Very stony fine sandy loam.	SM, ML	A-2, A-4	5-15	85-100	75-95	45-90	25-70	---	NP
	5-27	Fine sandy loam, loam.	SM, ML	A-2, A-4	0-5	85-100	75-95	45-90	25-70	---	NP
	27-60	Loamy fine sand, loamy coarse sand.	SM	A-1, A-2, A-4	5-30	75-90	65-85	40-80	15-50	---	NP
SrA, SrB Sudbury	0-4	Fine sandy loam	SM, ML	A-2, A-4	0-5	85-100	60-100	40-90	20-55	<25	NP
	4-20	Sandy loam, fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	0-5	85-100	60-100	40-80	20-50	<25	NP
	20-26	Gravelly coarse sand, loamy sand, sandy loam.	SM, SP-SM	A-1, A-2, A-3	0-5	70-100	60-100	30-70	5-35	<25	NP
	26-60	Stratified sand and gravel.	SP, SP-SM GP,GP-GM	A-1	10-40	35-70	25-65	15-45	0-10	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
SsB, SsC----------	0-7	Silt loam-------	CL, CL-ML	A-4, A-6	0	95-100	95-100	85-100	60-90	20-40	5-15
Suffield	7-35	Silt loam-------	CL, CL-ML	A-4, A-6	0	95-100	95-100	90-100	70-90	25-40	5-20
	35-60	Silty clay loam, silty clay.	CL	A-6, A-7	0	100	100	95-100	85-95	25-50	10-25
StA, StB, StC------	0-9	Fine sandy loam	SM, ML	A-2, A-4	0-10	75-95	65-90	60-80	30-70	<25	NP-3
Sutton	9-26	Fine sandy loam, loam, gravelly fine sandy loam.	SM, ML	A-2, A-4	0-10	75-95	65-90	50-80	25-65	<25	NP-3
	26-60	Fine sandy loam, gravelly sandy loam, sandy loam.	SM	A-2, A-4	5-15	60-90	55-85	45-70	20-45	---	NP
SuB, SuC----------	0-9	Very stony fine sandy loam.	SM, ML	A-2, A-4	5-20	75-95	65-90	60-80	30-70	<25	NP-3
Sutton	9-26	Fine sandy loam, loam, gravelly fine sandy loam.	SM, ML	A-2, A-4	5-15	75-95	65-90	50-80	25-65	<25	NP-3
	26-60	Fine sandy loam, gravelly sandy loam, sandy loam.	SM	A-2, A-4	5-15	60-90	55-85	45-70	20-45	---	NP
SwA, SwB----------	0-8	Fine sandy loam	SM, ML	A-2, A-4	0	100	95-100	60-95	30-65	---	NP
Swanton	8-28	Fine sandy loam, very fine sandy loam, sandy loam.	SM, ML	A-2, A-4	0	100	95-100	60-95	30-65	---	NP
	28-60	Silty clay loam, silty clay, clay.	CL, CH	A-7, A-6	0	100	100	90-100	75-95	25-60	15-45
UAC*. Udipsamments											
UD*. Udorthents											
UnA, UnB, UnC------	0-9	Very fine sandy loam.	ML	A-4	0	100	95-100	90-100	60-90	15-20	2-4
Unadilla	9-60	Silt loam, very fine sandy loam, loamy very fine sand.	ML	A-4	0	100	95-100	90-100	60-90	15-20	2-4
Ur*. Urban land											
WaA, WaB----------	0-10	Fine sandy loam	SM	A-2, A-4	0-5	90-100	85-100	70-100	30-50	<25	NP-3
Walpole	10-24	Fine sandy loam, sandy loam, gravelly sandy loam.	SM	A-2, A-4	0-5	85-100	60-100	40-95	25-50	---	NP
	24-60	Gravelly loamy sand, gravelly sand, sand.	SP, SM, GP	A-1, A-2, A-3	0-20	55-100	50-100	25-90	0-25	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Wb	0-8	Fine sandy loam	SM	A-2, A-1, A-4	0	100	70-100	45-85	20-50	<20	NP
Walpole Variant	8-25	Fine sandy loam, sandy loam.	SM	A-2, A-1, A-4	0	100	70-100	45-85	20-50	<20	NP
	25-60	Silt, silt loam	ML	A-4	0	100	100	90-100	70-100	<20	NP
WeA, WeB	0-8	Loamy sand	SM, SP-SM	A-1, A-2	0	85-100	75-100	40-85	10-35	---	---
Wareham	8-32	Loamy coarse sand, loamy fine sand, sand.	SM, SP-SM	A-1, A-2, A-3	0	85-100	75-100	25-85	5-35	---	---
	32-60	Coarse sand, loamy sand, very gravelly sand.	SP, SM, GM, GP	A-1, A-2, A-3	0-3	50-100	25-100	10-75	0-30	---	---
Wf	0-8	Fine sandy loam	ML, SM	A-4	0	100	100	50-70	35-65	<8	NP-8
Whately Variant	8-23	Loamy sand	SM	A-2	0	100	100	50-75	15-30	<5	NP
	23-60	Silty clay loam, clay, sandy clay.	CL	A-6, A-7	0	100	100	90-100	70-95	28-50	12-30
Wg	0-9	Loam	ML, CL, SM, SC	A-1, A-2, A-4	0-5	80-100	75-95	45-90	25-85	16-35	NP-10
Whitman	9-20	Sandy loam, gravelly fine sandy loam, gravelly loam.	ML, CL-ML, SM	A-1, A-2, A-4	0-10	65-95	60-90	35-85	20-60	16-35	NP-10
	20-60	Loamy sand, sandy loam, gravelly fine sandy loam	SM	A-1, A-2 A-4	5-15	65-95	60-90	30-75	15-50	---	NP
Wh	0-9	Extremely stony loam.	ML, CL, SM, SC	A-1, A-2, A-4	3-15	65-100	60-95	35-90	20-85	16-35	NP-10
Whitman	9-20	Sandy loam, gravelly fine sandy loam, gravelly loam.	ML, CL-ML, SM	A-1, A-2, A-4	0-10	65-95	60-90	35-85	20-60	16-35	NP-10
	20-60	Loamy sand, sandy loam, gravelly fine sandy loam sandy loam.	SM	A-1, A-2 A-4	5-15	65-95	60-90	30-75	15-50	---	NP
WnA, WnB, WnC, WnD-	0-10	Loamy sand	SM	A-2	0	95-100	85-100	35-85	20-35	---	NP
Windsor	10-16	Loamy sand, loamy fine sand.	SW-SM, SM	A-2	0	95-100	85-100	45-95	10-30	---	NP
	16-60	Sand, fine sand	SP-SM, SM	A-2, A-3	0	90-100	75-100	40-95	5-20	---	NP
WoC*, WoD*:											
Windsor	0-3	Loamy sand	SM	A-2	0	95-100	85-100	35-85	20-35	---	NP
	3-16	Loamy sand, loamy fine sand.	SW-SM, SM	A-2	0	95-100	85-100	45-95	10-30	---	NP
	16-60	Sand, fine sand	SP-SM, SM	A-2, A-3	0	90-100	75-100	40-95	5-20	---	NP
Rock outcrop.											
Wp	0-8	Very fine sandy loam.	ML, SM	A-4	0	100	95-100	90-100	40-90	<30	NP
Winooski	8-60	Silt loam, very fine sandy loam, loamy very fine sand.	ML, SM	A-4	0	100	95-100	90-100	40-90	<30	NP

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
WrA, WrB, WrC------	0-9	Fine sandy loam	CL-ML, SM, ML	A-2, A-4	0-10	85-95	70-90	60-85	30-65	<30	NP-10
Woodbridge	9-26	Fine sandy loam, loam, gravelly sandy loam, loam.	SM, ML, SC, SM-SC	A-2, A-4	0-15	75-95	65-90	40-85	25-60	<30	NP-10
	26-60	Fine sandy loam, loam, gravelly sandy loam, loam.	SM, ML, SC, SM-SC	A-2, A-4	5-15	70-90	60-90	35-85	25-60	<30	NP-10
WsB, WsC, WsD------ Woodbridge	0-6	Very stony fine sandy loam.	SM, ML	A-2, A-4	5-10	85-95	70-90	60-85	30-65	<30	NP-10
	6-25	Fine sandy loam, loam, gravelly sandy loam, loam.	SM, ML, SC, SM-SC	A-2, A-4	5-10	75-95	65-90	40-85	25-60	<30	NP-10
	25-60	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SC, SM-SC	A-2, A-4	5-15	70-90	60-90	35-85	25-60	<30	NP-10
WtB, WtC---------- Woodbridge	0-4	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	5-15	85-95	70-90	60-85	30-65	<30	NP-10
	4-25	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SC, SM-SC	A-2, A-4	5-10	75-95	65-90	40-85	25-60	<30	NP-10
	25-60	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SC, SM-SC	A-2, A-4	5-15	70-90	60-90	35-85	25-60	<30	NP-10

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
AgA, AgB, AgC----	0-9	2.0-6.0	0.13-0.25	4.5-6.0	Low----------	0.28	3
Agawam	9-30	2.0-20	0.11-0.18	4.5-6.0	Low----------	0.43	
	30-60	6.0-20	0.01-0.09	4.5-6.0	Low----------	0.17	
AmA, AmB----------	0-11	2.0-6.0	0.11-0.18	4.5-5.5	Low----------	0.28	3
Amostown	11-38	2.0-6.0	0.06-0.15	4.5-5.5	Low----------	0.28	
	38-60	0.06-2.0	0.09-0.21	4.5-7.3	Low----------	0.49	
Ba*.							
Beaches							
BeA, BeB, BeC----	0-9	0.6-2.0	0.17-0.30	5.1-6.5	Low----------	0.49	3
Belgrade	9-30	0.6-2.0	0.15-0.26	5.1-6.5	Low----------	0.64	
	30-60	0.06-2.0	0.15-0.26	5.1-6.5	Low----------	0.64	
Br----------	0-8	0.2-2.0	0.17-0.30	4.5-6.0	Low----------	0.49	3
Birdsall	8-25	0.2-0.6	0.15-0.26	5.1-7.3	Low----------	0.49	
	25-60	0.06-0.2	0.15-0.26	5.1-7.3	Low----------	0.49	
BuA, BuB, BuC----	0-10	0.2-2.0	0.14-0.22	4.5-6.5	Low----------	0.28	3
Buxton	10-30	0.2-0.6	0.11-0.21	4.5-6.5	Low----------	0.49	
	30-60	<0.2	0.09-0.21	5.6-7.3	Moderate-------	0.49	
BxB*, BxC*:							
Buxton----------	0-10	0.2-2.0	0.14-0.22	4.5-6.5	Low----------	0.28	3
	10-30	0.2-0.6	0.11-0.21	4.5-6.5	Low----------	0.49	
	30-60	<0.2	0.09-0.21	5.6-7.3	Moderate-------	0.49	
Rock outcrop.							
CaA, CaB, CaC, CaD----------	0-7	2.0-6.0	0.13-0.20	3.6-6.0	Low----------	0.24	3
Canton	7-33	2.0-6.0	0.13-0.20	3.6-6.0	Low----------	0.37	
	33-60	6.0-20	0.04-0.08	3.6-6.0	Low----------	0.17	
CbB, CbC, CbD----	0-6	2.0-6.0	0.13-0.20	3.6-6.0	Low----------	0.24	3
Canton	6-33	2.0-6.0	0.13-0.20	3.6-6.0	Low----------	0.37	
	33-60	6.0-20	0.04-0.08	3.6-6.0	Low----------	0.17	
CcB, CcC, CcD----	0-3	2.0-6.0	0.13-0.17	3.6-6.0	Low----------	0.24	3
Canton	3-33	2.0-6.0	0.13-0.20	3.6-6.0	Low----------	0.37	
	33-60	6.0-20	0.04-0.08	3.6-6.0	Low----------	0.17	
CDE*:							
Canton----------	0-3	2.0-6.0	0.13-0.17	3.6-6.0	Low----------	0.24	3
	3-25	2.0-6.0	0.13-0.20	3.6-6.0	Low----------	0.37	
	25-60	6.0-20	0.04-0.08	3.6-6.0	Low----------	0.17	
Charlton----------	0-4	0.6-6.0	0.05-0.15	4.5-6.0	Low----------	0.17	3
	4-28	0.6-6.0	0.05-0.20	4.5-6.0	Low----------	0.43	
	28-60	0.6-6.0	0.05-0.16	4.5-6.0	Low----------	0.43	
CeA, CeB----------	0-5	>20	0.03-0.14	3.6-6.0	Low----------	0.17	5
Carver	5-34	>20	0.01-0.11	3.6-5.5	Low----------	0.17	
	34-60	>20	0.01-0.06	3.6-5.5	Low----------	0.17	
CmB, CmC, CmD----	0-4	0.6-6.0	0.08-0.23	4.5-6.0	Low----------	0.20	3
Charlton	4-28	0.6-6.0	0.05-0.20	4.5-6.0	Low----------	0.43	
	28-60	0.6-6.0	0.05-0.16	4.5-6.0	Low----------	0.43	
CoB, CoC, CoD----	0-4	0.6-6.0	0.08-0.23	4.5-6.0	Low----------	0.17	3
Charlton	4-28	0.6-6.0	0.05-0.20	4.5-6.0	Low----------	0.43	
	28-60	0.6-6.0	0.05-0.16	4.5-6.0	Low----------	0.43	

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
CrB*, CrC*, CrD*:							
Charlton	0-4	0.6-6.0	0.08-0.23	4.5-6.0	Low	0.17	3
	4-28	0.6-6.0	0.05-0.20	4.5-6.0	Low	0.43	
	28-60	0.6-6.0	0.05-0.16	4.5-6.0	Low	0.43	
Rock outcrop.							
Hollis	0-5	0.6-6.0	0.10-0.21	4.5-6.0	Low	0.20	2
	5-16	0.6-6.0	0.06-0.18	4.5-6.0	Low	0.43	
	16	---	---	---	---	---	
De	0-9	6.0-20	0.07-0.13	4.5-6.5	Low	0.17	5
Deerfield	9-25	6.0-20	0.01-0.13	4.5-6.5	Low	0.15	
	25-60	>20	0.01-0.08	4.5-6.5	Low	0.15	
Du*.							
Dumps							
ElA, ElB	0-1	2.0-6.0	0.13-0.20	5.1-6.5	Low	0.32	3
Elmwood	1-35	2.0-6.0	0.13-0.22	5.1-6.5	Low	0.32	
	35-60	<0.2	0.12-0.18	6.1-7.3	High	0.49	
Ha	0-9	0.6-2.0	0.15-0.25	5.1-7.3	Low	0.49	3
Hadley	9-56	0.6-6.0	0.13-0.20	5.1-7.3	Low	0.49	
	56-60	0.6-6.0	0.10-0.20	5.6-7.8	Low	0.49	
HfA, HfB, HfC, HfD	0-7	6.0-20	0.03-0.23	3.6-6.0	Low	0.17	3
Hinckley	7-19	6.0-20	0.01-0.11	3.6-6.0	Low	0.17	
	19-60	>20	0.01-0.06	3.6-6.0	Low	0.15	
HWE*:							
Hinckley	0-3	6.0-20	0.03-0.23	3.6-6.0	Low	0.17	3
	3-15	6.0-20	0.01-0.11	3.6-6.0	Low	0.17	
	15-60	>20	0.01-0.06	3.6-6.0	Low	0.15	
Windsor	0-3	6.0->20	0.08-0.12	4.5-5.5	Low	0.17	5
	3-17	6.0->20	0.02-0.12	4.5-5.5	Low	0.17	
	17-60	6.0->20	0.01-0.08	4.5-5.5	Low	0.17	
IW*:							
Ipswich	0-18	0.6-20	0.18-0.35	5.1-7.3	Low	---	---
	18-42	0.6-20	0.18-0.35	5.1-7.3	Low	---	
	42-62	0.6-20	0.18-0.35	5.1-7.3	Low	---	
Westbrook	0-45	0.6-20	0.18-0.35	4.5-7.3	Low	---	---
	45-60	0.6-2.0	0.16-0.26	5.6-7.3	Low	0.64	
LeA, LeB	0-5	2.0-6.0	0.06-0.24	4.5-5.5	Low	0.17	3
Leicester	5-28	0.6-6.0	0.05-0.20	4.5-5.5	Low	0.43	
	28-60	0.6-6.0	0.04-0.16	4.5-6.0	Low	0.43	
Lr*:							
Limerick	0-13	0.6-2.0	0.18-0.25	5.1-7.3	Low	0.20	3
	13-25	0.6-2.0	0.18-0.25	5.6-7.3	Low	0.20	
	25-60	0.6-2.0	0.18-0.25	5.6-7.3	Low	0.20	
Rumney	0-5	2.0-6.0	0.11-0.20	4.5-6.5	Low	---	---
	5-29	2.0-6.0	0.11-0.19	4.5-6.5	Low	---	
	29-60	>6.0	0.01-0.13	4.5-6.5	Low	---	
Ma	0-7	0.2-0.6	0.12-0.30	5.1-6.0	Low	---	---
Maybid	7-19	<0.2	0.09-0.17	5.6-7.3	Moderate	---	
	19-60	<0.2	0.09-0.18	6.1-7.3	Moderate	---	
MC*, MD*.							
Medisaprists							

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
MeB	0-4	2.0-6.0	0.11-0.20	5.1-6.0	Low	0.32	3
Melrose	4-32	2.0-6.0	0.10-0.16	5.1-6.0	Low	0.32	
	32-60	<0.2	0.12-0.16	5.1-7.3	High	0.49	
MmA, MmB, MmC, MmD	0-18	2.0-6.0	0.18-0.19	3.6-6.0	Low	0.17	3
Merrimac	18-26	2.0-6.0	0.15-0.17	3.6-6.0	Low	0.24	
	26-60	6.0-20.0	0.01-0.06	3.6-6.0	Low	0.17	
MoB, MoC, MoD	0-2	0.6-6.0	0.16-0.20	3.6-6.0	Low	0.43	3
Montauk	2-30	0.6-6.0	0.10-0.16	3.6-6.0	Low	0.24	
	30-60	0.06-0.6	0.02-0.08	3.6-6.0	Low	0.20	
MsB, MsC, MsD	0-2	0.6-6.0	0.11-0.15	3.6-6.0	Low	0.24	3
Montauk	2-30	0.6-6.0	0.10-0.16	3.6-6.0	Low	0.24	
	30-60	0.06-0.6	0.02-0.16	3.6-6.0	Low	0.20	
MxC	0-2	0.6-6.0	0.11-0.15	3.6-6.0	Low	0.24	3
Montauk	2-30	0.6-6.0	0.10-0.16	3.6-6.0	Low	0.24	
	30-60	0.06-0.6	0.02-0.16	3.6-6.0	Low	0.20	
NnA, NnB	0-9	2.0-6.0	0.13-0.25	4.5-6.0	Low	0.28	3
Ninigret	9-23	2.0-6.0	0.06-0.18	4.5-6.0	Low	0.43	
	23-60	6.0-20	0.01-0.13	4.5-6.0	Low	0.17	
PaB, PaC, PaD, PbB, PbC, PbD	0-6	0.6-6.0	0.08-0.23	4.5-6.0	Low	0.24	3
Paxton	6-21	0.6-6.0	0.06-0.20	4.5-6.5	Low	0.43	
	21-60	<0.2	0.05-0.12	4.5-6.5	Low	0.17	
PcC, PcD, PcE	0-4	0.6-6.0	0.05-0.15	4.5-6.0	Low	0.24	3
Paxton	4-21	0.6-6.0	0.06-0.20	4.5-6.5	Low	0.43	
	21-60	<0.2	0.05-0.12	4.5-6.5	Low	0.17	
Pe	0-8	6.0-20	0.07-0.10	4.5-7.3	Low	0.17	5
Pipestone	8-21	6.0-20	0.06-0.09	4.5-7.3	Low	0.17	
	21-60	>20	0.05-0.07	5.1-7.3	Low	0.17	
Pg*. Pits, gravel							
Qu*. Quarries							
Ra	0-10	0.6-2.0	0.20-0.25	5.1-7.3	Low	0.49	3
Raynham	10-36	0.2-2.0	0.18-0.22	5.1-7.3	Low	0.64	
	36-60	0.06-0.2	0.18-0.22	5.6-7.8	Low	0.64	
RdA, RdB	0-9	0.6-6.0	0.06-0.24	4.5-6.0	Low	0.24	3
Ridgebury	9-18	0.6-6.0	0.04-0.20	4.5-6.0	Low	0.32	
	18-60	<0.2	---	4.5-6.0	Low	0.24	
RlA*, RlB*:							
Ridgebury	0-5	0.6-6.0	0.06-0.24	4.5-6.0	Low	0.24	3
	5-18	0.6-6.0	0.04-0.20	4.5-6.0	Low	0.24	
	18-60	<0.2	---	4.5-6.0	Low	0.24	
Leicester	0-5	0.6-6.0	0.06-0.28	4.5-5.5	Low	0.17	3
	5-28	0.6-6.0	0.05-0.16	4.5-5.5	Low	0.43	
	28-60	2.0-6.0	0.04-0.16	4.5-6.0	Low	0.43	
RnC*, RnD*: Rock outcrop.							
Buxton	0-4	0.2-2.0	0.14-0.22	4.5-6.5	Low	0.28	3
	4-30	0.2-0.6	0.11-0.21	4.5-6.5	Low	0.49	
	30-60	<0.2	0.09-0.21	5.6-7.3	Moderate	0.49	

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
RoC*, RoD*: Rock outcrop.							
Charlton	0-4	0.6-6.0	0.08-0.23	4.5-6.0	Low	0.17	3
	4-28	0.6-6.0	0.05-0.20	4.5-6.0	Low	0.43	
	28-60	0.6-6.0	0.05-0.16	4.5-6.0	Low	0.43	
Hollis	0-5	0.6-6.0	0.10-0.21	4.5-6.0	Low	0.20	2
	5-16	0.6-6.0	0.06-0.18	4.5-6.0	Low	0.43	
	16	---	---	---	---	---	
Rx*: Rock outcrop.							
Hollis	0-5	0.6-6.0	0.10-0.21	4.5-6.0	Low	0.20	2
	5-16	0.6-6.0	0.06-0.18	4.5-6.0	Low	0.43	
	16	---	---	---	---	---	
Sa	0-5	0.6-2.0	0.16-0.30	5.1-5.5	Low	0.49	3
Saco Variant	5-20	0.6-2.0	0.14-0.26	5.6-6.0	Low	0.49	
	20-60	6.0-20	0.02-0.13	5.6-6.5	Low	0.17	
ScA, ScB	0-11	0.2-2.0	0.14-0.30	5.1-7.3	Low	0.28	3
Scantic	11-26	<0.2	0.11-0.21	5.1-7.3	Moderate	0.49	
	26-60	<0.2	0.09-0.21	5.6-7.3	Moderate	0.49	
Se	0-5	>6.0	0.10-0.23	4.5-6.0	Low	0.17	3
Scarboro	5-26	>6.0	0.01-0.13	4.5-6.0	Low	0.10	
	26-60	>6.0	0.01-0.13	4.5-6.0	Low	0.10	
SgB, SgC	0-10	2.0-6.0	0.11-0.21	4.5-6.0	Low	0.24	3
Scituate	10-27	2.0-6.0	0.09-0.16	4.5-6.0	Low	0.24	
	27-60	0.06-0.2	0.01-0.07	4.5-6.0	Low	0.24	
ShB, ShC	0-5	2.0-6.0	0.11-0.21	4.0-6.0	Low	0.24	3
Scituate	5-27	2.0-6.0	0.09-0.16	4.0-6.0	Low	0.24	
	27-60	0.6-0.2	0.01-0.07	4.0-6.0	Low	0.24	
SrA, SrB	0-4	2.0-6.0	0.10-0.25	3.6-6.0	Low	0.17	3
Sudbury	4-20	2.0-6.0	0.07-0.18	3.6-6.0	Low	0.17	
	20-26	2.0-20	0.01-0.15	3.6-6.0	Low	0.17	
	26-60	6.0-20	0.01-0.06	3.6-6.0	Low	0.17	
SsB, SsC	0-7	0.6-2.0	0.16-0.30	5.1-6.5	Low	0.28	3
Suffield	7-35	0.6-2.0	0.14-0.26	5.1-6.5	Low	0.43	
	35-60	<0.2	0.11-0.18	5.6-7.3	Moderate	0.49	
StA, StB, StC	0-9	0.6-6.0	0.09-0.25	4.5-6.0	Low	0.20	3
Sutton	9-26	0.6-6.0	0.07-0.20	4.5-6.0	Low	0.43	
	26-60	0.6-6.0	0.04-0.16	4.5-6.0	Low	0.43	
SuB, SuC	0-9	0.6-6.0	0.09-0.23	4.5-6.0	Low	0.20	3
Sutton	9-26	0.6-6.0	0.04-0.16	4.5-6.5	Low	0.43	
	26-60	0.6-20	0.04-0.16	4.5-6.5	Low	0.43	
SwA, SwB	0-8	2.0-6.0	0.13-0.25	5.1-6.0	Low	0.32	3
Swanton	8-28	2.0-6.0	0.12-0.20	5.1-6.0	Low	0.32	
	28-60	<0.2	0.12-0.16	5.6-7.3	Moderate	0.49	
UAC*. Udipsamments							
UD*. Udorthents							

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
UnA, UnB, UnC----	0-9	0.6-2.0	0.18-0.21	4.5-6.0	Low----------	0.49	3
Unadilla	9-60	0.6-2.0	0.17-0.20	4.5-6.0	Low----------	0.64	
Ur*.							
Urban land							
WaA, WaB----------	0-10	2.0-6.0	0.10-0.23	4.5-6.0	Low----------	0.20	3
Walpole	10-24	2.0-6.0	0.07-0.18	4.5-6.0	Low----------	0.28	
	24-60	>6.0	0.01-0.13	4.5-6.0	Low----------	0.17	
Wb----------	0-8	2.0-6.0	0.15-0.23	4.5-6.0	Low----------	0.28	3
Walpole Variant	8-25	2.0-6.0	0.13-0.18	4.5-6.0	Low----------	0.28	
	25-60	0.2-0.6	0.14-0.26	5.1-6.5	Low----------	0.49	
WeA, WeB----------	0-10	6.0-20	0.06-0.15	3.6-5.5	Low----------	0.17	5
Wareham	10-32	6.0-20	0.03-0.13	3.6-5.5	Low----------	0.17	
	32-60	6.0-20	0.01-0.13	3.6-5.5	Low----------	0.17	
Wf----------	0-8	0.6-6.0	0.12-0.18	5.6-6.5	Low----------	0.28	3
Whately Variant	8-23	2.0-6.0	0.07-0.13	5.6-6.5	Low----------	0.17	
	23-60	<0.2	0.10-0.18	6.1-7.3	Moderate-------	0.24	
Wg----------	0-9	0.6-6.0	0.13-0.23	4.5-7.3	Low----------	0.24	3
Whitman	9-20	0.6-6.0	0.10-0.17	4.5-6.5	Low----------	0.24	
	20-60	<0.2	0.02-0.03	4.5-6.5	Low----------	0.24	
Wh----------	0-9	0.6-6.0	0.15-0.28	4.5-6.5	Low----------	0.24	3
Whitman	9-20	0.6-6.0	0.10-0.17	4.5-6.5	Low----------	0.24	
	20-60	<0.2	0.02-0.03	4.5-6.5	Low----------	0.24	
WnA, WnB, WnC,							
WnD----------	0-10	6.0->20	0.08-0.12	4.5-5.5	Low----------	0.17	5
Windsor	10-16	6.0->20	0.02-0.12	4.5-5.5	Low----------	0.17	
	16-60	6.0->20	0.01-0.08	4.5-5.5	Low----------	0.17	
WoC*, WoD*:							
Windsor---------	0-3	6.0->20	0.08-0.12	4.5-5.5	Low----------	0.17	5
	3-16	6.0->20	0.02-0.12	4.5-5.5	Low----------	0.17	
	16-60	6.0->20	0.01-0.08	4.5-5.5	Low----------	0.17	
Rock outcrop.							
Wp----------	0-8	0.6-6.0	0.15-0.30	4.5-7.3	Low----------	0.49	3
Winooski	8-60	0.6-6.0	0.13-0.26	4.5-7.3	Low----------	0.49	
WrA, WrB, WrC----	0-9	0.6-6.0	0.08-0.23	4.5-6.0	Low----------	0.24	3
Woodbridge	9-26	0.6-6.0	0.06-0.20	4.5-6.0	Low----------	0.43	
	26-60	<0.2	0.05-0.12	4.5-6.0	Low----------	0.17	
WsB, WsC, WsD----	0-6	0.6-6.0	0.08-0.23	4.5-6.0	Low----------	0.24	3
Woodbridge	6-25	0.6-6.0	0.06-0.20	4.5-6.0	Low----------	0.43	
	25-60	<0.2	0.05-0.12	4.5-6.0	Low----------	0.17	
WtB, WtC----------	0-4	0.6-6.0	0.08-0.23	4.5-6.0	Low----------	0.24	3
Woodbridge	4-25	0.6-6.0	0.06-0.20	4.5-6.0	Low----------	0.43	
	25-60	<0.2	0.05-0.12	4.5-6.0	Low----------	0.17	

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--SOIL AND WATER FEATURES

[The definitions of "flooding" and "water table" in the Glossary explain terms such as "rare," "brief," "apparent," and "perched." The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
AgA, AgB, AgC----- Agawam	B	None--------	---	---	>6.0	---	---	Low------	Low------	High
AmA, AmB---------- Amostown	C	None--------	---	---	1.0-2.5	Apparent	Dec-Apr	Moderate	Moderate	Moderate
Ba*. Beaches										
BeA, BeB, BeC----- Belgrade	B	None--------	---	---	1.5-3.5	Apparent	Nov-Apr	High-----	Moderate	Moderate
Br---------- Birdsall	D	None--------	---	---	0-1.0	Apparent	Oct-Jul	High-----	High-----	High
BuA, BuB, BuC----- Buxton	C	None--------	---	---	1.0-3.0	Perched	Nov-May	High-----	High-----	Moderate
BxB*, BxC*: Buxton----------	C	None--------	---	---	1.0-3.0	Perched	Nov-May	High-----	High-----	Moderate
Rock outcrop.										
CaA, CaB, CaC, CaD, CbB, CbC, CbD, CcB, CcC, CcD---------- Canton	B	None--------	---	---	>6.0	---	---	Low------	Low------	High
CDE*: Canton----------	B	None--------	---	---	>6.0	---	---	Low------	Low------	High
Charlton---------	B	None--------	---	---	>6.0	---	---	Low------	Low------	High
CeA, CeB---------- Carver	A	None--------	---	---	>6.0	---	---	Low------	Low------	High
CmB, CmC, CmD, CoB, CoC, CoD---- Charlton	B	None--------	---	---	>6.0	---	---	Low------	Low------	High
CrB*, CrC*, CrD*: Charlton---------	B	None--------	---	---	>6.0	---	---	Low------	Low------	High
Rock outcrop.										
Hollis----------	C/D	None--------	---	---	>6.0	---	---	Moderate	Low------	High
De---------- Deerfield	B	None--------	---	---	1.0-3.0	Apparent	Dec-Apr	Moderate	Low------	High
Du*. Dumps										
ElA, ElB---------- Elmwood	C	None--------	---	---	1.0-3.0	Perched	Nov-May	High-----	Moderate	Moderate
Ha---------- Hadley	B	Occasional	Brief-----	Oct-Apr	3.0-6.0	Apparent	Nov-May	High-----	Low------	Moderate
HfA, HfB, HfC, HfD---------- Hinckley	A	None--------	---	---	>6.0	---	---	Low------	Low------	High

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
HWE*:										
Hinckley	A	None	---	---	>6.0	---	---	Low	Low	High.
Windsor	A	None	---	---	>6.0	---	---	Low	Low	High.
IW*:										
Ipswich	D	Frequent	Very brief	Jan-Dec	+1-0.0	Apparent	Jan-Dec	---	High	High.
Westbrook	D	Frequent	Very brief	Jan-Dec	+1-0.0	Apparent	Jan-Dec	---	High	High.
LeA, LeB---------- Leicester	C	None	---	---	0-1.5	Apparent	Nov-May	High	Low	High.
Lr*:										
Limerick	C	Frequent	Brief	Oct-Jun	0-1.5	Apparent	Nov-Jun	High	High	Low.
Rumney	C	Frequent	Brief	Oct-May	0-1.5	Apparent	Nov-Jun	High	High	High.
Ma---------- Maybid	D	None	---	---	0-0.5	Perched	Nov-Aug	High	High	Moderate.
MC*, MD*. Medisaprists										
MeB---------- Melrose	C	None	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
MmA, MmB, MmC, MmD---------- Merrimac	A	None	---	---	>6.0	---	---	Low	Low	High.
MoB, MoC, MoD, MsB, MsC, MsD, MxC---------- Montauk	C	None	---	---	>6.0	---	---	Moderate	Low	High.
NnA, NnB---------- Ninigret	B	None	---	---	1.5-3.5	Apparent	Nov-Apr	Moderate	Low	High.
PaB, PaC, PaD, PbB, PbC, PbD, PcC, PcD, PcE---- Paxton	C	None	---	---	>6.0	---	---	Moderate	Low	Moderate.
Pe---------- Pipestone	A	None	---	---	0.5-1.5	Apparent	Oct-Jun	Moderate	Low	Moderate.
Pg*. Pits, gravel										
Qu*. Quarries										
Ra---------- Raynham	C	None	---	---	0.5-2.0	Apparent	Nov-Jun	High	High	Moderate.
RdA, RdB---------- Ridgebury	C	None	---	---	0-1.5	Perched	Nov-May	High	High	High.
RlA*, RlB*:										
Ridgebury	C	None	---	---	0-1.5	Perched	Nov-May	High	High	High.
Leicester	C	None	---	---	0-1.5	Apparent	Nov-Mar	High	Low	High.

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
RnC*, RnD*: Rock outcrop.										
Buxton	C	None	---	---	1.0-3.0	Perched	Nov-May	High	High	Moderate.
RoC*, RoD*: Rock outcrop.										
Charlton	B	None	---	---	>6.0	---	---	Low	Low	High.
Hollis	C/D	None	---	---	>6.0	---	---	Moderate	Low	High.
Rx*: Rock outcrop.										
Hollis	C/D	None	---	---	>6.0	---	---	Moderate	Low	High.
Sa Saco Variant	C	Frequent	Brief	Nov-May	0-1.0	Apparent	Nov-Jun	High	High	Moderate.
ScA, ScB Scantic	C	None	---	---	0-1.0	Perched	Oct-Jun	High	High	Moderate.
Se Scarboro	D	Rare	---	---	0-1.0	Apparent	Jan-Dec	High	Moderate	High.
SgB, SgC, ShB, ShC Scituate	C	None	---	---	1.0-3.0	Perched	Dec-Apr	High	Moderate	High.
SrA, SrB Sudbury	B	None	---	---	1.0-3.0	Apparent	Dec-Apr	Moderate	Low	High.
SsB, SsC Suffield	C	None	---	---	>6.0	---	---	High	Moderate	Moderate.
StA, StB, StC, SuB, SuC Sutton	B	None	---	---	1.5-3.5	Apparent	Nov-Apr	Moderate	Low	High.
SwA, SwB Swanton	B/D	None	---	---	0-1.5	Apparent	Nov-May	High	High	Moderate.
UAC*. Udipsamments										
UD*. Udorthents										
UnA, UnB, UnC Unadilla	B	None to rare	---	---	>6.0	---	---	Moderate	Low	Moderate.
Ur*. Urban land										
WaA, WaB Walpole	C	None	---	---	0-1.0	Apparent	Nov-Apr	High	Low	High.
Wb Walpole Variant	C	None	---	---	0-1.0	Apparent	Nov-Jun	High	High	High.
WeA, WeB Wareham	C	None	---	---	0-1.5	Apparent	Sep-Jun	Moderate	Moderate	High.
Wf Whately Variant	C	None	---	---	0-1.0	Apparent	Nov-Jun	High	High	Moderate.

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
Wg, Wh---------- Whitman	D	None--------	---	---	0.0-0.5	Perched	Sep-Jun	High-----	High-----	High.
WnA, WnB, WnC, WnD---------- Windsor	A	None--------	---	---	>6.0	---	---	Low------	Low------	High.
WoC*, WoD*: Windsor----------	A	None--------	---	---	>6.0	---	---	Low------	Low------	High.
Rock outcrop.										
Wp---------- Winooski	B	Occasional	Brief-----	Sep-Apr	1.0-3.0	Apparent	Dec-Apr	High-----	Moderate	Moderate.
WrA, WrB, WrC, WsB, WsC, WsD, WtB, WtC--------- Woodbridge	C	None--------	---	---	1.5-3.0	Perched	Nov-Mar	High-----	Moderate	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--CLASSIFICATION OF THE SOILS

[An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series]

Soil name	Family or higher taxonomic class
Agawam	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts
Amostown	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Belgrade	Coarse-silty, mixed, mesic Aquic Dystric Eutrochrepts
Birdsall	Coarse-silty, mixed, nonacid, mesic Typic Humaquepts
Buxton	Fine, mixed, mesic Aquic Dystric Eutrochrepts
Canton	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts
Carver	Mixed, mesic Typic Udipsamments
Charlton	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Deerfield	Mixed, mesic Aquic Udipsamments
Elmwood	Coarse-loamy over clayey, mixed, mesic Aquic Dystric Eutrochrepts
Hadley	Coarse-silty, mixed, nonacid, mesic Typic Udifluvents
Hinckley	Sandy-skeletal, mixed, mesic Typic Udorthents
Hollis	Loamy, mixed, mesic Lithic Dystrochrepts
Ipswich	Euic, mesic Typic Sulfihemists
Leicester	Coarse-loamy, mixed, acid, mesic Aeric Haplaquepts
*Limerick	Coarse-silty, mixed, nonacid, mesic Typic Fluvaquents
Maybid	Fine, illitic, nonacid, mesic Typic Humaquepts
*Melrose	Coarse-loamy over clayey, mixed, mesic Typic Dystrochrepts
Merrimac	Sandy, mixed, mesic Typic Dystrochrepts
Montauk	Coarse-loamy, mixed, mesic Typic Fragiochrepts
Ninigret	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Aquic Dystrochrepts
*Paxton	Coarse-loamy, mixed, mesic Typic Fragiochrepts
*Pipestone	Sandy, mixed, mesic Entic Haplaquods
*Raynham	Coarse-silty, mixed, nonacid, mesic Aeric Haplaquepts
Ridgebury	Coarse-loamy, mixed, mesic Aeric Fragiaquepts
Rumney	Coarse-loamy, mixed, nonacid, mesic Aeric Fluvaquents
Saco Variant	Coarse-silty over sandy or sandy-skeletal, mixed, nonacid, mesic Typic Fluvaquents
Scantic	Fine, illitic, nonacid, mesic Typic Haplaquepts
Scarboro	Sandy, mixed, mesic Histic Humaquepts
Scituate	Coarse-loamy, mixed, mesic Typic Fragiochrepts
Sudbury	Sandy, mixed, mesic Aquic Dystrochrepts
Suffield	Coarse-silty over clayey, mixed, mesic Dystric Eutrochrepts
Sutton	Coarse-loamy, mixed, mesic Aquic Dystrochrepts
Swanton	Coarse-loamy over clayey, mixed, nonacid, mesic Aeric Haplaquepts
Unadilla	Coarse-silty, mixed, mesic Typic Dystrochrepts
Walpole	Sandy, mixed, mesic Aeric Haplaquepts
Walpole Variant	Coarse-loamy, mixed, nonacid, mesic Aeric Haplaquepts
Wareham	Mixed, mesic Humaqueptic Psammaquents
Westbrook	Euic, mesic Typic Sulfihemists
Whately Variant	Sandy over clayey, mixed, mesic Typic Haplaquolls.
Whitman	Coarse-loamy, mixed, mesic Humic Fragiaquepts
Windsor	Mixed, mesic Typic Udipsamments
*Winooski	Coarse-silty, mixed, nonacid, mesic Aquic Udifluvents
Woodbridge	Coarse-loamy, mixed, mesic Typic Fragiochrepts

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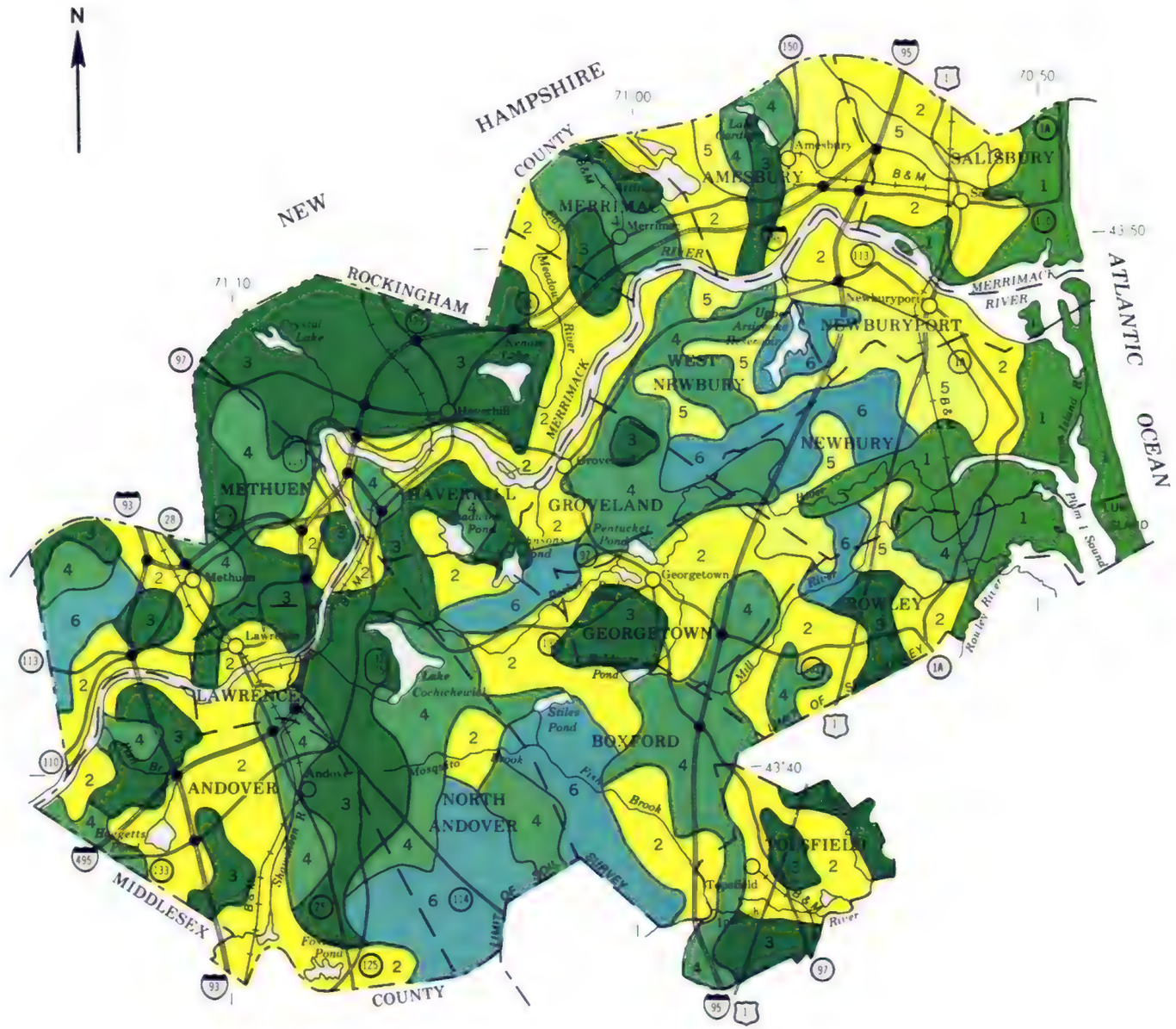


LEGEND*

- 1 — Ipswich-Westbrook-Udipsamments association: Deep, nearly level, very poorly drained, mucky soils formed in organic deposits; gently sloping to very steep, excessively drained, sandy soils formed in windblown sand
- 2 — Hinckley-Windsor-Merrimac association: Deep, nearly level to steep, excessively drained and somewhat excessively drained, sandy and loamy soils formed in outwash deposits
- 3 — Paxton-Woodbridge-Montauk association: Deep, nearly level to steep, well drained and moderately well drained, loamy soils formed in compact glacial till
- 4 — Canton-Charlton-Sutton association: Deep, nearly level to steep, well drained and moderately well drained, loamy soils formed in friable glacial till
- 5 — Scantic-Maybid-Buxton association: Deep, nearly level to moderately sloping, very poorly drained to moderately well drained, loamy soils formed in lacustrine or marine sediments
- 6 — Charlton-Rock outcrop-Medisaprists association: Deep, nearly level to steep, well drained, loamy soils formed in glacial till; Rock outcrop; and deep, nearly level, very poorly drained, mucky soils formed in organic deposits

*The texture given in the descriptive heading refers to the texture of the surface layer of the major soils in each association.

Compiled 1979

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

MASSACHUSETTS AGRICULTURE EXPERIMENT STATION

GENERAL SOIL MAP

ESSEX COUNTY, MASSACHUSETTS

NORTHERN PART

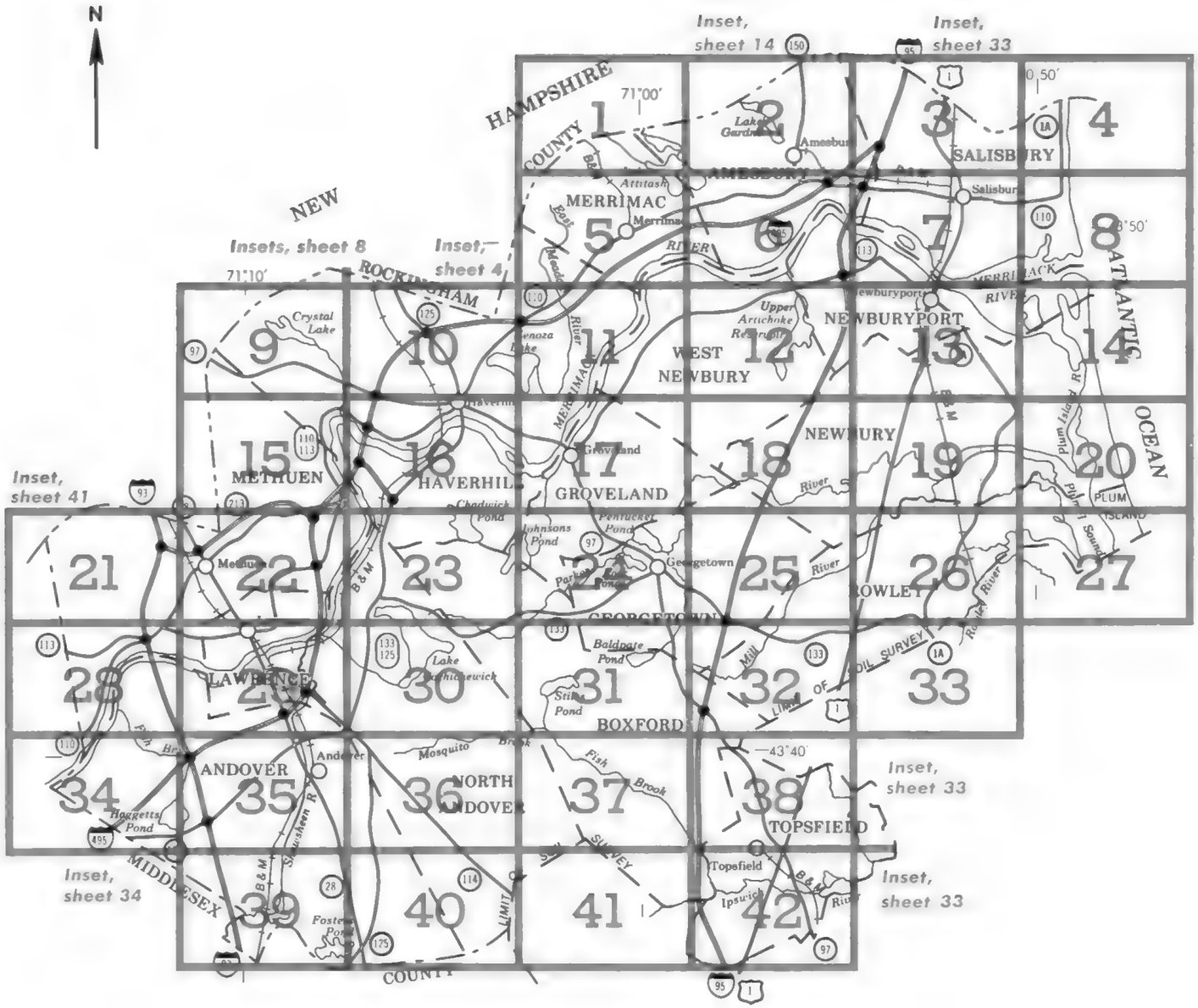
Scale 1:190,080

1 0 1 2 3 4 Miles

1 0 1 2 3 4 Kilometers

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

1-12891



U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

INDEX TO MAP SHEETS

ESSEX COUNTY, MASSACHUSETTS

NORTHERN PART

Scale 1:190,080

1 0 1 2 3 4 Miles

1 0 1 2 3 4 Kilometers

SOIL LEGEND

The publication symbol consists of letters. The first letter, always a capital, is the initial letter of the soil name. The second letter is a capital if the mapping unit is broadly defined; otherwise, it is a small letter. The third letter, always a capital A, B, C, D, or E, indicates the slope. Most symbols without a slope letter are those of nearly level soils, however, some are for units that have considerable range of slope but have similar use interpretations.

SYMBOL	NAME
AgA	Agawam fine sandy loam, 0 to 3 percent slopes
AgB	Agawam fine sandy loam, 3 to 8 percent slopes
AgC	Agawam fine sandy loam, 8 to 15 percent slopes
AmA	Amostown fine sandy loam, 0 to 3 percent slopes
AmB	Amostown fine sandy loam, 3 to 8 percent slopes
Ba	Beaches
BeA	Belgrade very fine sandy loam, 0 to 3 percent slopes
BeB	Belgrade very fine sandy loam, 3 to 8 percent slopes
BeC	Belgrade very fine sandy loam, 8 to 15 percent slopes
Br	Birdsall silt loam
BuA	Buxton silt loam, 0 to 3 percent slopes
BuB	Buxton silt loam, 3 to 8 percent slopes
BuC	Buxton silt loam, 8 to 15 percent slopes
BxB	Buxton-Rock outcrop complex, 3 to 8 percent slopes
BxC	Buxton-Rock outcrop complex, 8 to 15 percent slopes
CaA	Canton fine sandy loam, 0 to 3 percent slopes
CaB	Canton fine sandy loam, 3 to 8 percent slopes
CaC	Canton fine sandy loam, 8 to 15 percent slopes
CaD	Canton fine sandy loam, 15 to 25 percent slopes
CbB	Canton very stony fine sandy loam, 3 to 8 percent slopes
CbC	Canton very stony fine sandy loam, 8 to 15 percent slopes
CbD	Canton very stony fine sandy loam, 15 to 25 percent slopes
CcB	Canton extremely stony fine sandy loam, 3 to 8 percent slopes
CcC	Canton extremely stony fine sandy loam, 8 to 15 percent slopes
CcD	Canton extremely stony fine sandy loam, 15 to 25 percent slopes
CDE	Canton and Charlton extremely stony fine sandy loams, steep
CeA	Carver loamy coarse sand, 0 to 3 percent slopes
CeB	Carver loamy coarse sand, 3 to 8 percent slopes
CmB	Charlton fine sandy loam, 3 to 8 percent slopes
CmC	Charlton fine sandy loam, 8 to 15 percent slopes
CmD	Charlton fine sandy loam, 15 to 25 percent slopes
CoB	Charlton very stony fine sandy loam, 3 to 8 percent slopes
CoC	Charlton very stony fine sandy loam, 8 to 15 percent slopes
CoD	Charlton very stony fine sandy loam, 15 to 25 percent slopes
CrB	Charlton-Rock outcrop-Hollis complex, 3 to 8 percent slopes
CrC	Charlton-Rock outcrop-Hollis complex, 8 to 15 percent slopes
CrD	Charlton-Rock outcrop-Hollis complex, 15 to 25 percent slopes
De	Deerfield loamy fine sand
Du	Dumps
E1A	Elmwood fine sandy loam, 0 to 3 percent slopes
E1B	Elmwood fine sandy loam, 3 to 8 percent slopes
Ha	Hadley very fine sandy loam
HfA	Hinckley loamy sand, 0 to 3 percent slopes
HfB	Hinckley loamy sand, 3 to 8 percent slopes
HfC	Hinckley loamy sand, 8 to 15 percent slopes
HfD	Hinckley loamy sand, 15 to 25 percent slopes
HWE	Hinckley and Windsor loamy sands, steep
IW	Ipswich and Westbrook mucky peats
LeA	Leicester fine sandy loam, 0 to 3 percent slopes
LeB	Leicester fine sandy loam, 3 to 8 percent slopes
Lr	Limerick and Rumney soils
Ma	Maybid silt loam
MC	Medisaprists, deep
MD	Medisaprists, shallow
MeB	Melrose fine sandy loam, 3 to 8 percent slopes
MmA	Merrimac fine sandy loam, 0 to 3 percentslopes
MmB	Merrimac fine sandy loam, 3 to 8 percent slopes
MmC	Merrimac fine sandy loam, 8 to 15 percent slopes
MmD	Merrimac fine sandy loam, 15 to 25 percent slopes
MoB	Montauk fine sandy loam, 3 to 8 percent slopes
MoC	Montauk fine sandy loam, 8 to 15 percent slopes
MoD	Montauk fine sandy loam, 15 to 25 percent slopes
MsB	Montauk very stony fine sandy loam, 3 to 8 percent slopes
MsC	Montauk very stony fine sandy loam, 8 to 15 percent slopes
MsD	Montauk very stony fine sandy loam, 15 to 25 percent slopes
MxC	Montauk extremely stony fine sandy loam, 5 to 20 percent slopes
NnA	Ninigret fine sandy loam, 0 to 3 percent slopes
NnB	Ninigret fine sandy loam, 3 to 8 percent slopes
PaB	Paxton fine sandy loam, 3 to 8 percent slopes
PaC	Paxton fine sandy loam, 8 to 15 percent slopes
PaD	Paxton fine sandy loam, 15 to 25 percent slopes
PbB	Paxton very stony fine sandy loam, 3 to 8 percent slopes
PbC	Paxton very stony fine sandy loam, 8 to 15 percent slopes
PbD	Paxton very stony fine sandy loam, 15 to 25 percent slopes
PcC	Paxton extremely stony fine sandy loam, 8 to 15 percent slopes
PcD	Paxton extremely stony fine sandy loam, 15 to 25 percent slopes
PcE	Paxton extremely stony fine sandy loam, 25 to 45 percent slopes
Pe	Pipestone loamy sand
Pg	Pits, gravel
Qu	Quarries
Ra	Raynham silt loam
RdA	Ridgebury fine sandy loam, 0 to 3 percent slopes
RdB	Ridgebury fine sandy loam, 3 to 8 percent slopes
R1A	Ridgebury and Leicester extremely stony fine sandy loams, 0 to 3 percent slopes
R1B	Ridgebury and Leicester extremely stony fine sandy loams, 3 to 8 percent slopes
RnC	Rock outcrop-Buxton complex, 3 to 15 percent slopes
RnD	Rock outcrop-Buxton complex, 15 to 25 percent slopes
RoC	Rock outcrop-Charlton-Hollis complex, 3 to 15 percent slopes
RoD	Rock outcrop-Charlton-Hollis complex, 15 to 35 percent slopes
Rx	Rock outcrop-Hollis complex
Sa	Saco Variant silt loam
ScA	Scantic silt loam, 0 to 3 percent slopes
ScB	Scantic silt loam, 3 to 8 percent slopes
Se	Scarboro muck fine sandy loam
SgB	Scituate fine sandy loam, 3 to 8 percent slopes
SgC	Scituate fine sandy loam, 8 to 15 percent slopes
ShB	Scituate very stony fine sandy loam, 3 to 8 percent slopes
ShC	Scituate very stony fine sandy loam, 8 to 15 percent slopes
SrA	Sudbury fine sandy loam, 0 to 3 percent slopes
SrB	Sudbury fine sandy loam, 3 to 8 percent slopes
SsB	Suffield silt loam, 3 to 8 percent slopes
SsC	Suffield silt loam, 8 to 15 percent slopes
StA	Sutton fine sandy loam, 0 to 3 percent slopes
StB	Sutton fine sandy loam, 3 to 8 percent slopes
StC	Sutton fine sandy loam, 8 to 15 percent slopes
SuB	Sutton very stony fine sandy loam, 3 to 8 percent slopes
SuC	Sutton very stony fine sandy loam, 8 to 15 percent slopes
SwA	Swanton fine sandy loam, 0 to 3 percent slopes
SwB	Swanton fine sandy loam, 3 to 8 percent slopes
UAC	Udipsamments, rolling
UD	Udorthents, smoothed
UnA	Unadilla very fine sandy loam, 0 to 3 percent slopes
UnB	Unadilla very fine sandy loam, 3 to 8 percent slopes
UnC	Unadilla very fine sandy loam, 8 to 15 percent slopes
Ur	Urban land
WaA	Walpole fine sandy loam, 0 to 3 percent slopes
WaB	Walpole fine sandy loam, 3 to 8 percent slopes
Wb	Walpole Variant fine sandy loam
WeA	Wareham loamy sand, 0 to 3 percent slopes
WeB	Wareham loamy sand, 3 to 8 percent slopes
Wf	Whately Variant fine sandy loam
Wg	Whitman loam
Wh	Whitman extremely stony loam
WnA	Windsor loamy sand, 0 to 3 percent slopes
WnB	Windsor loamy sand, 3 to 8 percent slopes
WnC	Windsor loamy sand, 8 to 15 percent slopes
WnD	Windsor loamy sand, 15 to 25 percent slopes
WoC	Windsor-Rock outcrop complex, 3 to 15 percent slopes
WoD	Windsor-Rock outcrop complex, 15 to 25 percent slopes
Wp	Winooski very fine sandy loam
WrA	Woodbridge fine sandy loam, 0 to 3 percent slopes
WrB	Woodbridge fine sandy loam, 3 to 8 percent slopes
WrC	Woodbridge fine sandy loam, 8 to 15 percent slopes
WsB	Woodbridge very stony fine sandy loam, 0 to 8 percent slopes
WsC	Woodbridge very stony fine sandy loam, 8 to 15 percent slopes
WsD	Woodbridge very stony fine sandy loam, 15 to 25 percent slopes
WtB	Woodbridge extremely stony fine sandy loam, 3 to 8 percent slopes
WtC	Woodbridge extremely stony fine sandy loam, 8 to 15 percent slopes

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline & neatline

AD HOC BOUNDARY (label)

- Small airport, airfield, park, oilfield, cemetery, or flood pool

STATE COORDINATE TICK

LAND DIVISION CORNERS (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEMS & DESIGNATIONS

- Interstate
- Federal
- State
- County, farm or ranch

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or small

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label)
- Located object (label)
- Tank (label)
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label)
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial
- Intermittent

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

GULLY

DEPRESSION OR SINK

SOIL SAMPLE SITE (normally not shown)

MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Made land non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot
- Stripped land

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART — SHEET NUMBER 1

720 000 FEET

685 000 FEET

735 000 FEET

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 1

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture. Soil Conservation Service and cooperating agencies

Coordinate grid ticks and land division corners, if shown are approximately positioned

N

1 Mile

5 000 Feet

Scale 1:15 840

0 1 000 2 000 3 000 4 000 5 000

(Joins sheet 2)

(Joins sheet 5)

NEW HAMPSHIRE

ROCKINGHAM COUNTY

TUNBURY POND

water

Back Se

Se River

Cobbler Brook

BRUSH HILL

HIGHLANDS HILL

BEAR HILL

AMESBURY

LAKE ATTITASH

N

Scale 1:15 840

1 Mile

5 000 Feet

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Coordinate grid ticks and land division corners, if shown, are approximately positioned.

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART — SHEET NUMBER 3

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 3

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Coordinate grid ticks and land division corners, if shown are approximately positioned

(Joins inset, sheet 33)

(Joins sheet 2)

(Joins sheet 4)

(Joins sheet 7)

685 000 FEET

1 775 000 FEET

Salisbury Plains

BATT HILL

MUNDY HILL

ROCKINGHAM COUNTY

NEW HAMPSHIRE

Smallpox Brook

Meadow Brook

Brown Brook

BOSTON AND MAINE

water

3

N

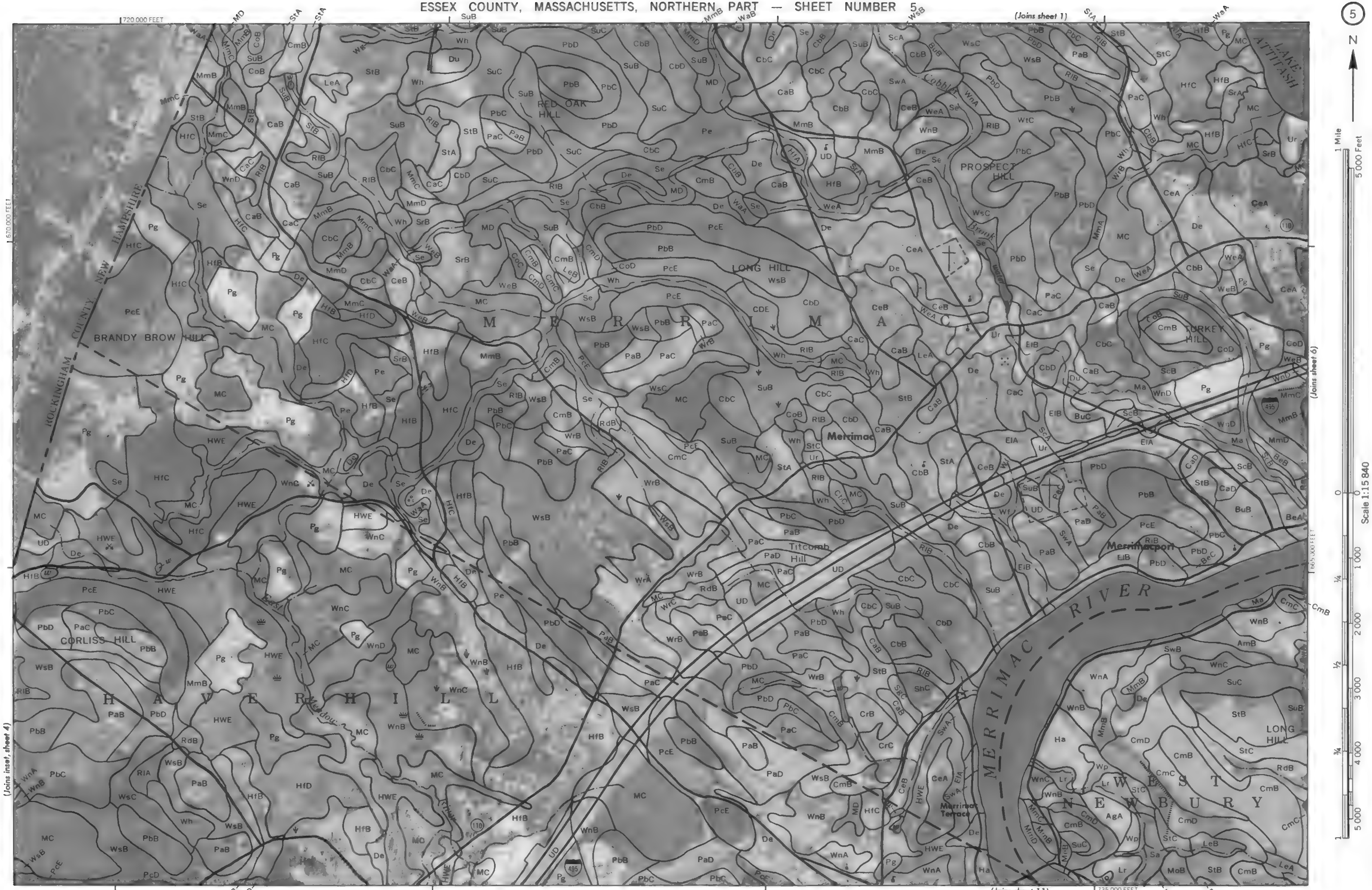
1 Mile

5 000 Feet

Scale 1:15 840

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown are approximately positioned.

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 4



ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 5

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART — SHEET NUMBER 6

N

(Joins sheet 2)

LAKE ATTITASH

POND HILL

MERRIMAC

POPLAR HILL

(Joins sheet 5)

MERRIMAC RIVER

SALISBURY

LONE TREE HILL

Bailey Pond

NEWBURYPORT

WEST NEWBURY

ARTICHOKE RIVER

LOWER ARTICHOKE RESERVOIR

water

Creek

(Joins sheet 7)

(Joins sheet 12)

755 000 FEET

670 000 FEET

665 000 FEET

740 000 FEET

Scale 1:15 840

1 Mile 5 000 Feet

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies.

Coordinate grid ticks and land division corners, if shown are approximately positioned

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART — SHEET NUMBER 7

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 7

This map is compiled as of 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies

Coordinate grid ticks and land division corners, if shown are approximately positioned

760 000 FEET

775 000 FEET

AMESBURY

SALISBURY

NEWBURYPORT

Eagle Island

Deer Island

Salisbury Point

Rings Island

CARR ISLAND

RAM ISLAND

MERRIMAC RIVER

TOWN CREEK

Merrill Creek

(Joins sheet 3)

(Joins sheet 6)

(Joins sheet 8)

(Joins sheet 13)

7

N

1 Mile

5 000 Feet

Scale 1:15 840

8

N

1 Mile

5 000 Feet

Scale 1:15 840

0 1 000 2 000 3 000 4 000 5 000

¼ ½ ¾ 1

(Joins sheet 4)

784 000 FEET

670 000 FEET

650 000 FEET

(Joins sheet 7)

(Joins sheet 14)

4000 AND 5000 FOOT GRID TICKS

SALISBURY

Salisbury Beach

Brawns Point

ATLANTIC OCEAN

BEACH

ALLEN CREEK

ROCK CREEK

SHAD CREEK

BLACK CREEK

MERRIMAC RIVER

NEWBURYPORT

PLUM ISLAND

THE BASIN

Plum Island

NEWBURY

INSET A

710 000 FEET

664 000 FEET

660 000 FEET

700 000 FEET

(Joins inset B)

(Joins sheet 10)

4000 AND 5000-FOOT GRID TICKS

ROCKINGHAM COUNTY

NEW HAMPSHIRE

HAVERHILL

PARSONAGE HILL

INSET B

695 000 FEET

664 000 FEET

640 000 FEET

690 000 FEET

(Joins inset A)

(Joins sheet 9)

4000 AND 5000-FOOT GRID TICKS

ROCKINGHAM COUNTY

NEW HAMPSHIRE

HAVERHILL

PARSONAGE HILL

Camp Brook

Fishin Brook

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown are approximately positioned

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 9

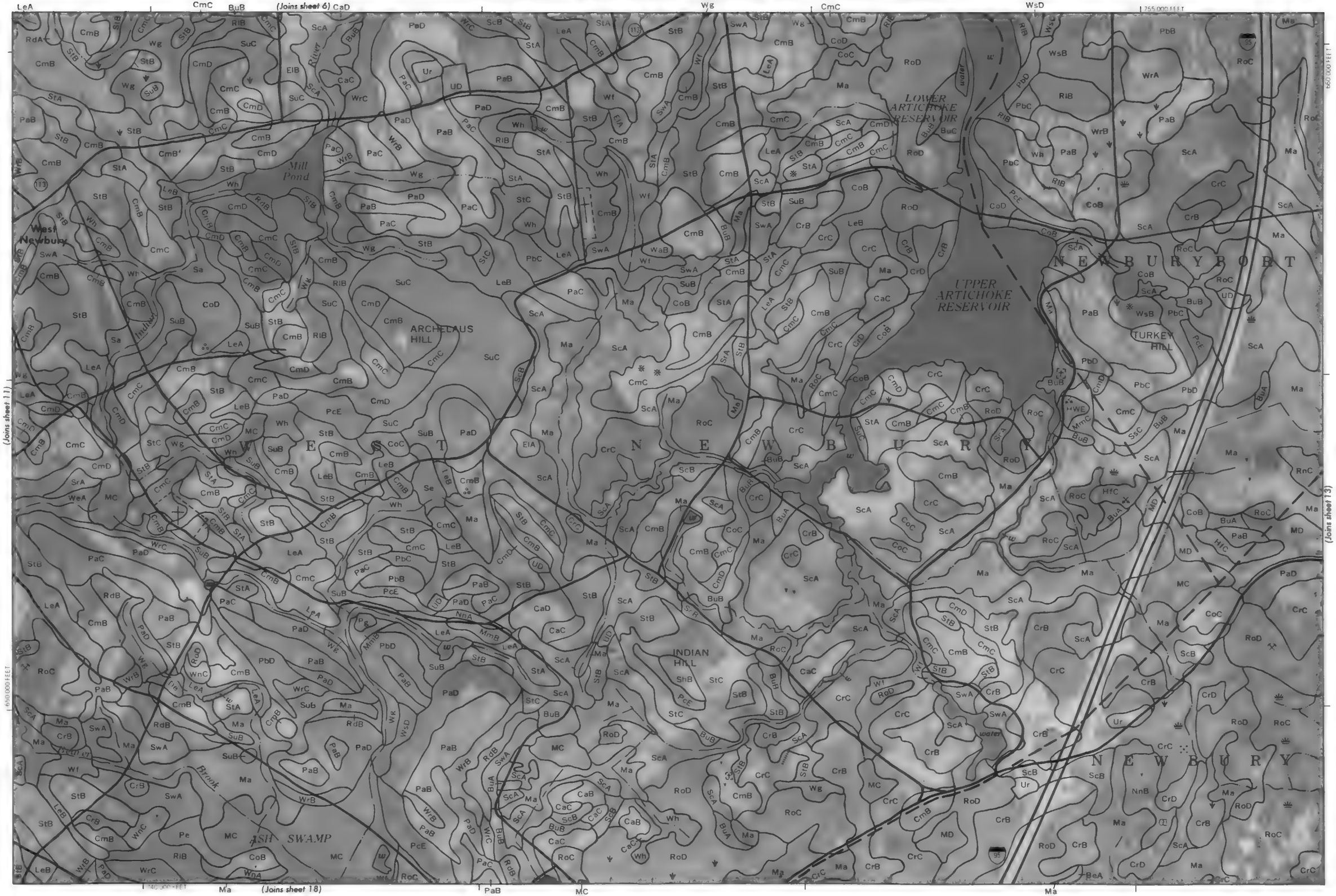
This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown are approximately positioned

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART — SHEET NUMBER 10

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown are approximately positioned.

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 11
This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown are approximately positioned

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART — SHEET NUMBER 12



Scale 1:15 840

1 Mile 5 000 Feet

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown are approximately positioned

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 12

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART — SHEET NUMBER 13

ESSEX COUNTY, MASSACHUSETTS NORTHERN PART NO. 13

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown are approximately positioned

13

N

1 Mile
5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

1 000 2 000 3 000 4 000 5 000

760 000 FEET

660 000 FEET

650 000 FEET

775 000 FEET

(Joins sheet 7)

(Joins sheet 14)

(Joins sheet 12)

(Joins sheet 19)

NEWBURY

NEWBURYPORT

MERRIMAC RIVER

PLEASANT VIEW AIRPORT

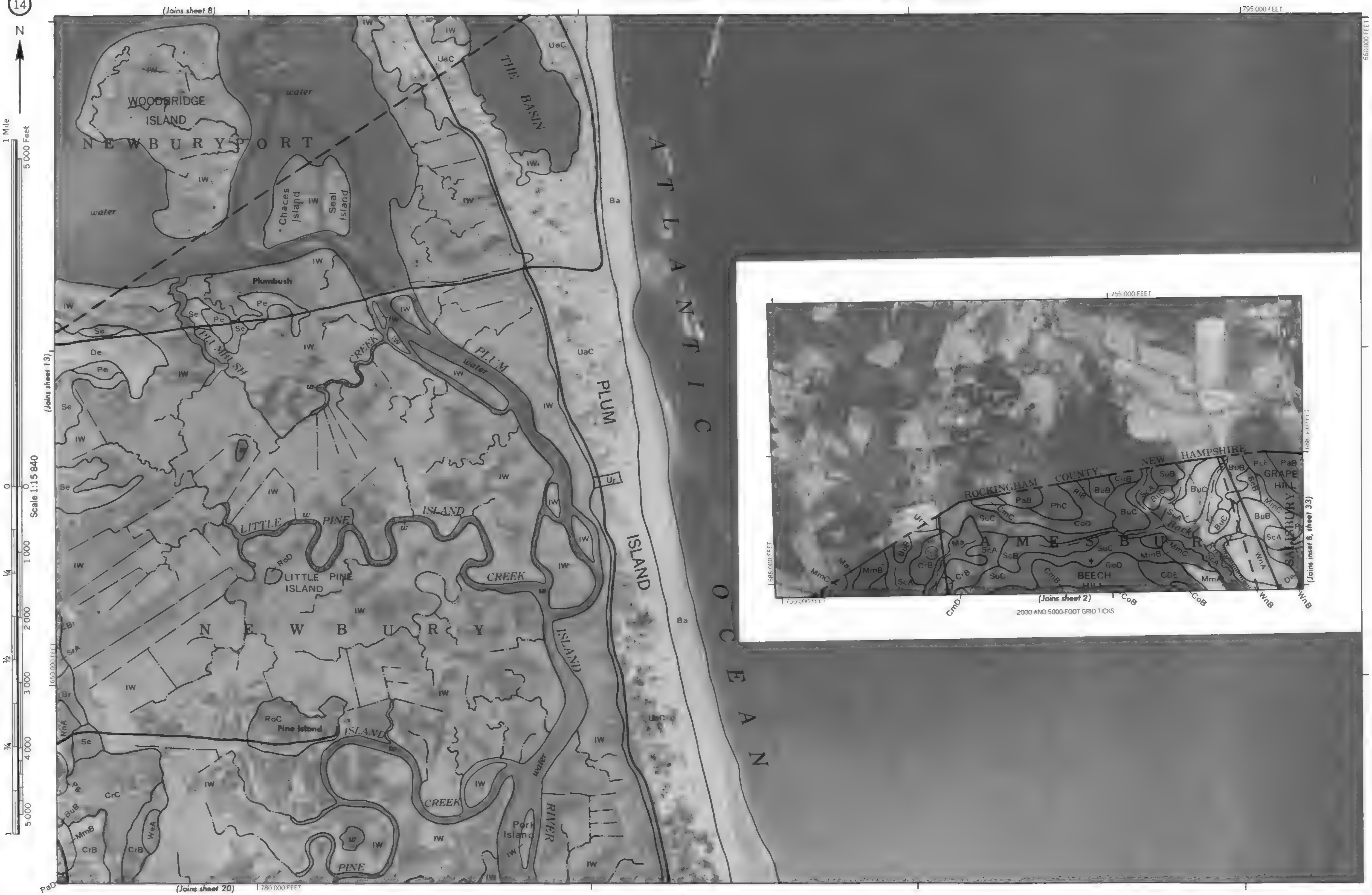
Joppa

Little River

LITTLE BUBT RIVER

Quails Pond

MAINE



This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately positioned

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART — SHEET NUMBER 15

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 15

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies

Coordinate grid ticks and land division corners, if shown are approximately positioned

680 000 FEET

645 000 FEET

635 000 FEET

695 000 FEET

(Joins sheet 9)

(Joins sheet 16)

(Joins sheet 22)

(Joins inset, sheet 41)

ROCKINGHAM COUNTY, NEW HAMPSHIRE

SCOTLAND HILL

Groveland Park

Maple Park

Tozier Corner

RESERVOIR HILL

PIE HILL

Marston Corners

HAVERHILL

MERRIMAC RIVER

METHUEN

Hawkes Brook

Meadow Brook

15

N

1 Mile

5 000 Feet

Scale 1:15 840

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART — SHEET NUMBER 16

16

N

1 Mile 5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1 1 000 2 000 3 000 4 000 5 000

715 000 FEET

645 000 FEET

634 000 FEET

700 000 FEET

(Joins sheet 10)

(Joins sheet 15)

(Joins sheet 17)

(Joins sheet 23)

HAVERHILL

Bradford

SILVER HILL

GOLDEN HILL

Hales Island

Kimball Island

LONE TREE HILL

WARD HILL

BUSH HILL

DEAD HILL

CHADWICK POND

MERRIMAC RIVER

METHUEN

BOSTON AND MAINE

water

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown are approximately positioned

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 16

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART — SHEET NUMBER 17

(17)

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 11)

(Joins sheet 18)

(Joins sheet 16)

(Joins sheet 24)

GOLDEN HILL

HAVERHILL

Riverside

MERRIMAC RIVER

GROVELAND

WEST NEWBURY

BEAR HILL

GEORGETOWN

DEAD HILL

South Groveland

635 000 FEET

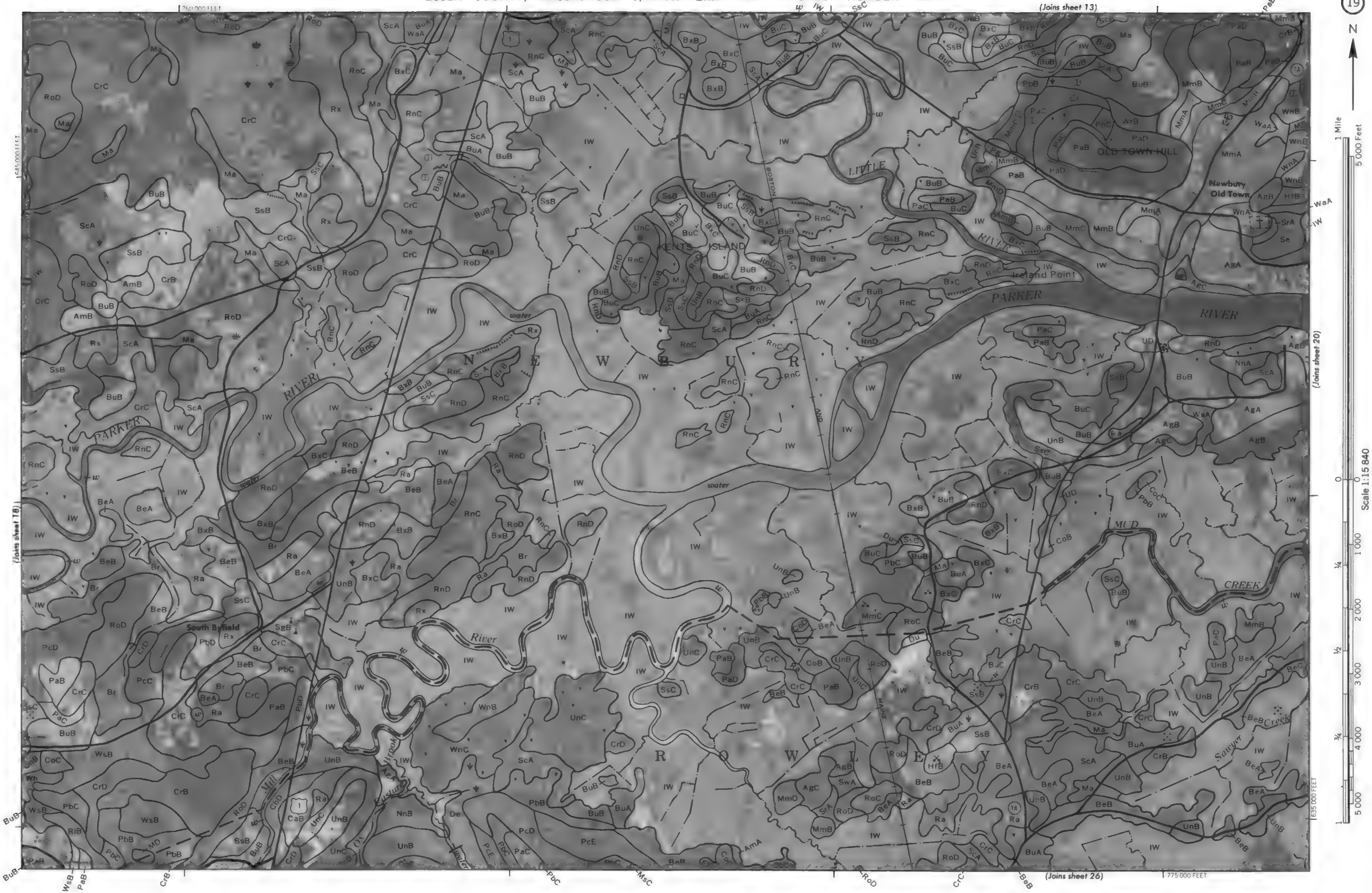
735 000 FEET

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 17

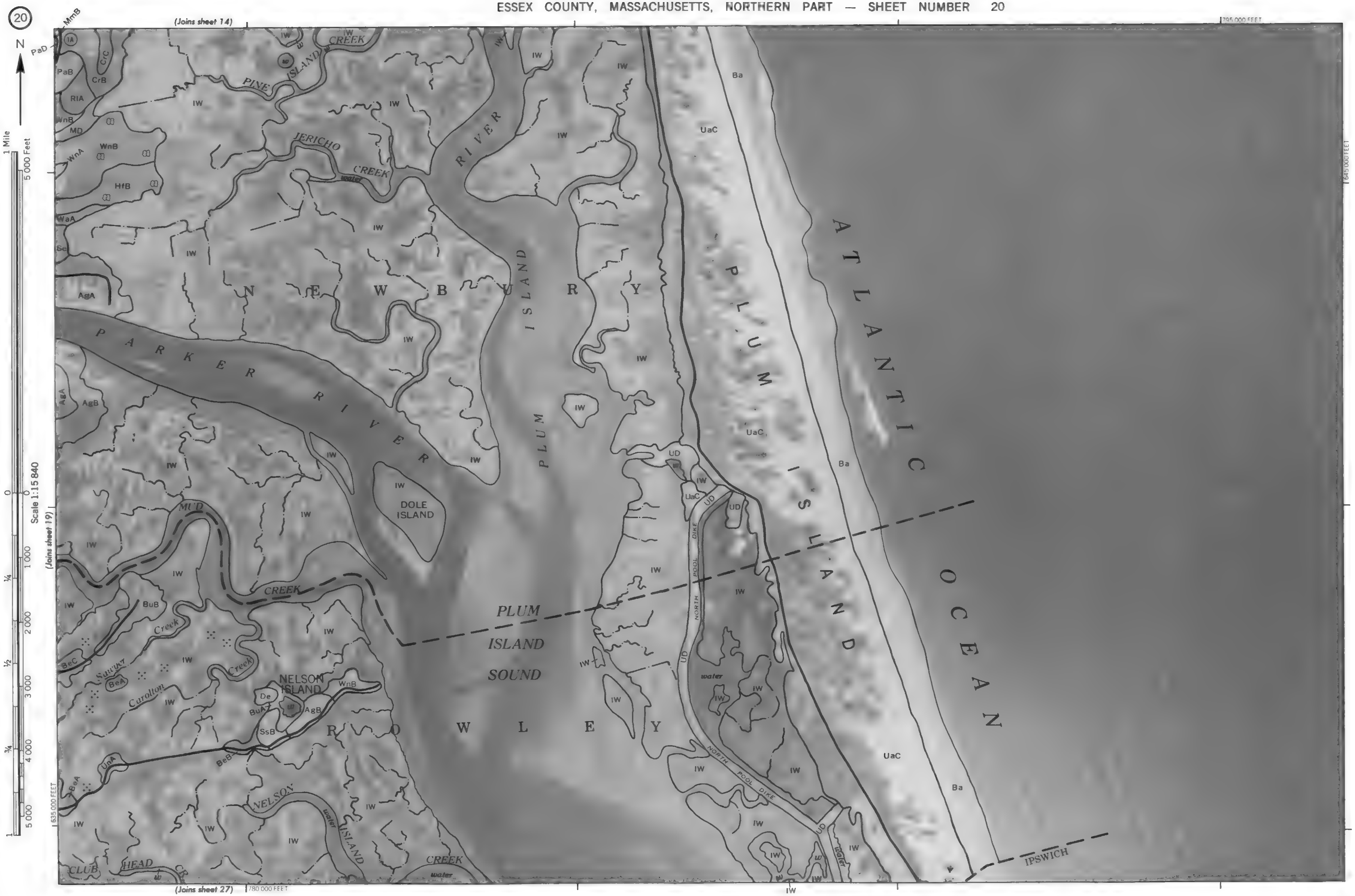
This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies

Coordinate grid ticks and land division corners, if shown are approximately positioned

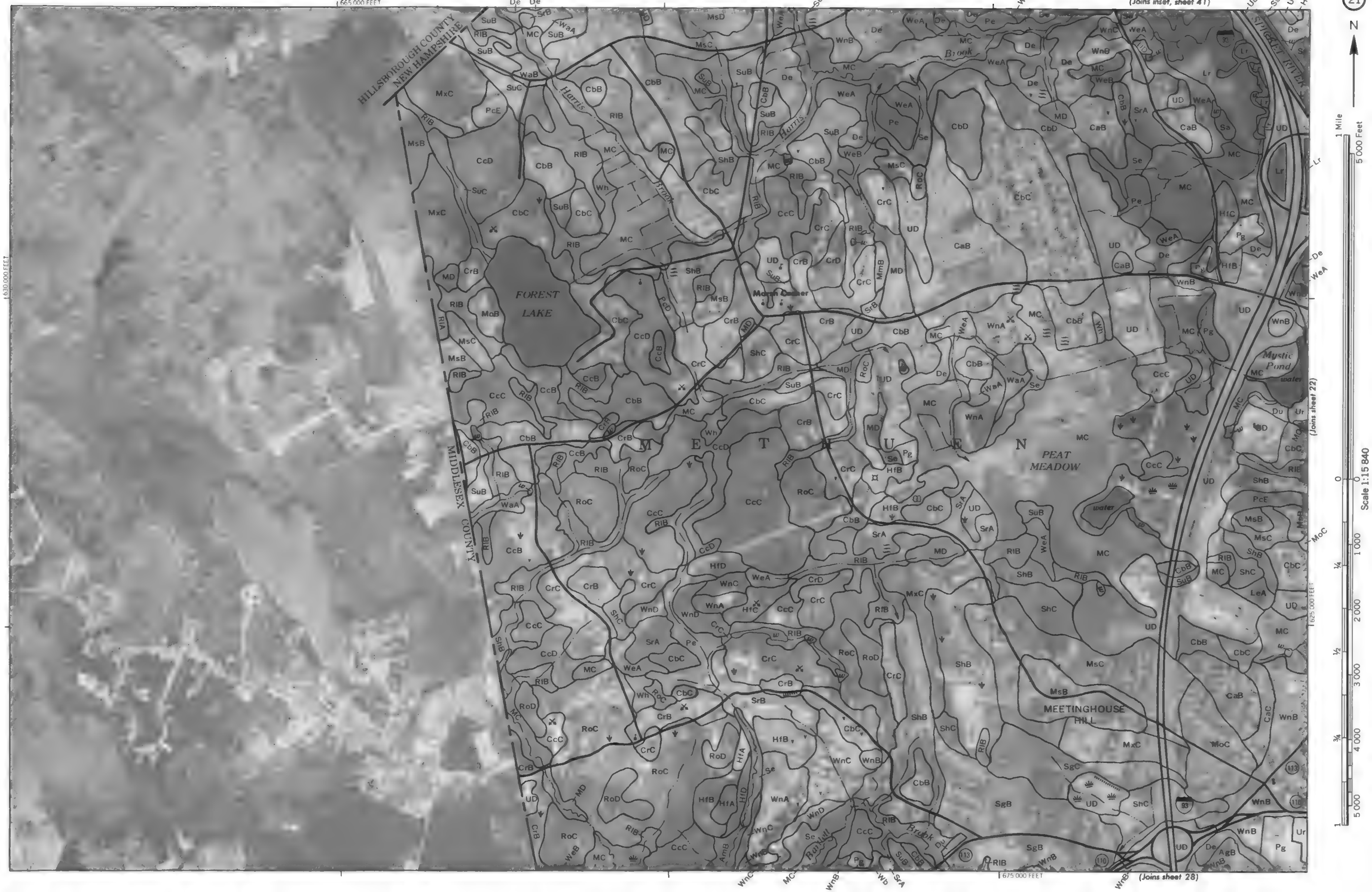
This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown are approximately positioned.



ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 19
This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown are approximately positioned.



This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown are approximately positioned



ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 21

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown are approximately positioned

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART — SHEET NUMBER 22

22

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

695 000 FEET

680 000 FEET

630 000 FEET

(Joins sheet 15)

(Joins sheet 21)

(Joins sheet 29)

(Joins sheet 23)

ROCKINGHAM COUNTY
NEW HAMPSHIRE

METHUEN

LAWRENCE

MERRIMAC

NORTH ANDOVER

GUNPOWDER HILL

DADDY FRYE HILL

TOWER HILL

Searles Pond

Stevens Pond

Mystic Pond

SPICKET RIVER

MERRIMACK RIVER

MAINE

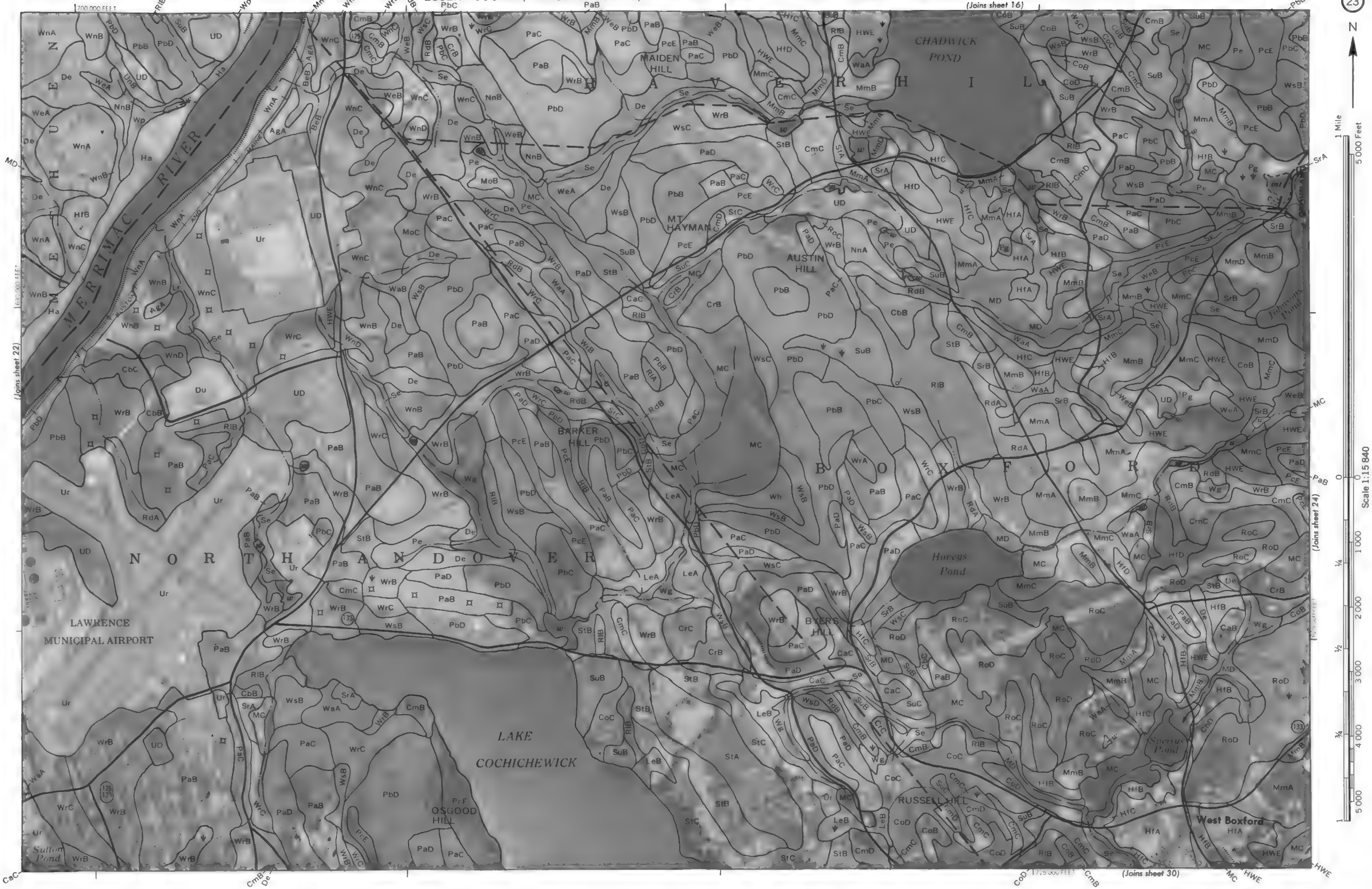
BOSTON

GAS

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies

Coordinate grid ticks and land division corners, if shown are approximately positioned

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 22



ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 23

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown are approximately positioned

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART — SHEET NUMBER 24

24

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

720 000 FEET

735 000 FEET

630 000 FEET

625 000 FEET

HAVERHILL

JOHNSONS POND

PENTUCKET POND

ROCK POND

GEORGETOWN

BOXFORD

LITTLES HILL

BALDPATE HILL

REDSHANKS HILL

South Georgetown

South Groveland

water

River

Parker

(Joins sheet 17)

(Joins sheet 23)

(Joins sheet 25)

(Joins sheet 31)

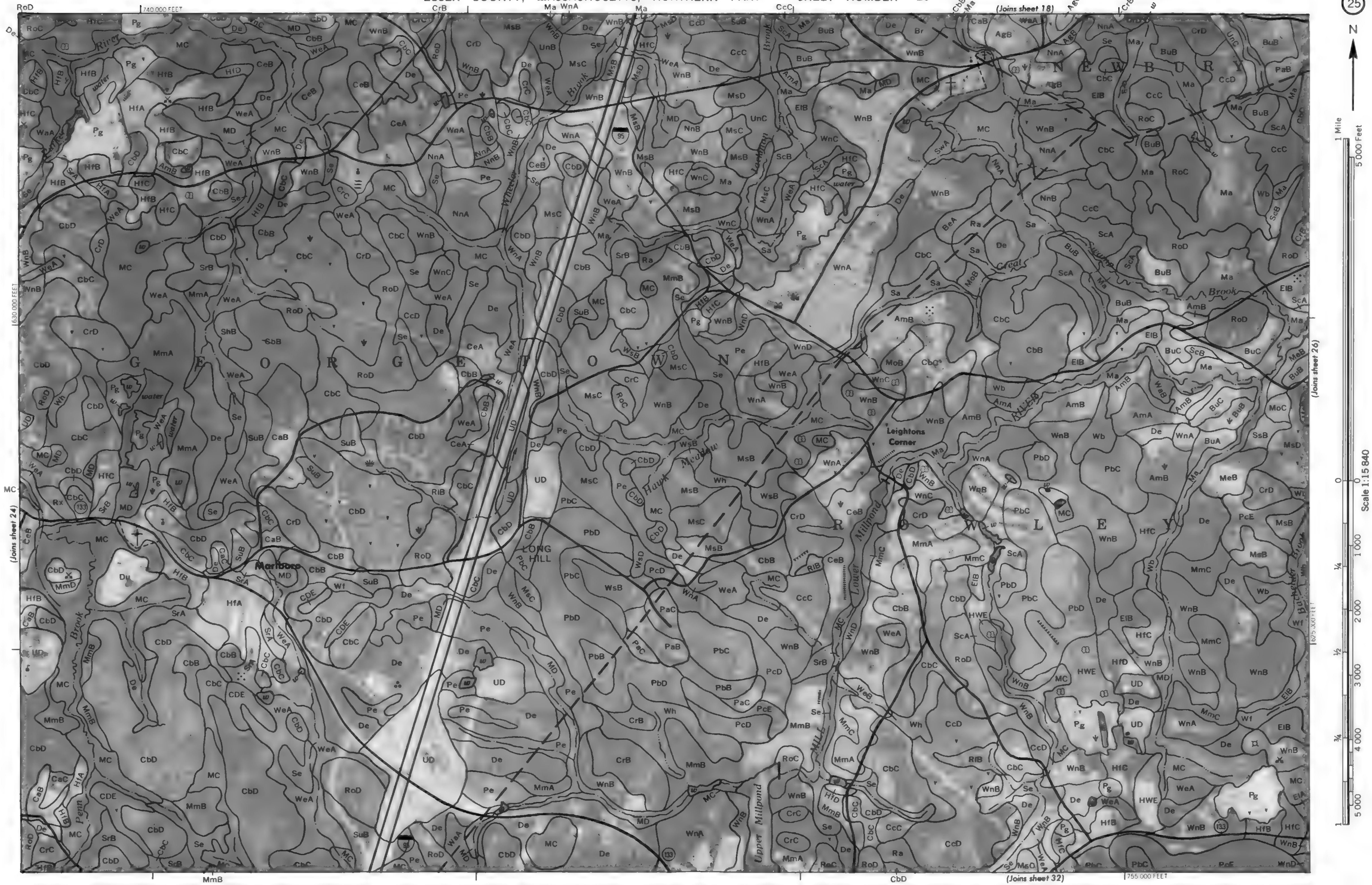
This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies

Coordinate grid ticks and land division corners, if shown are approximately positioned

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 24

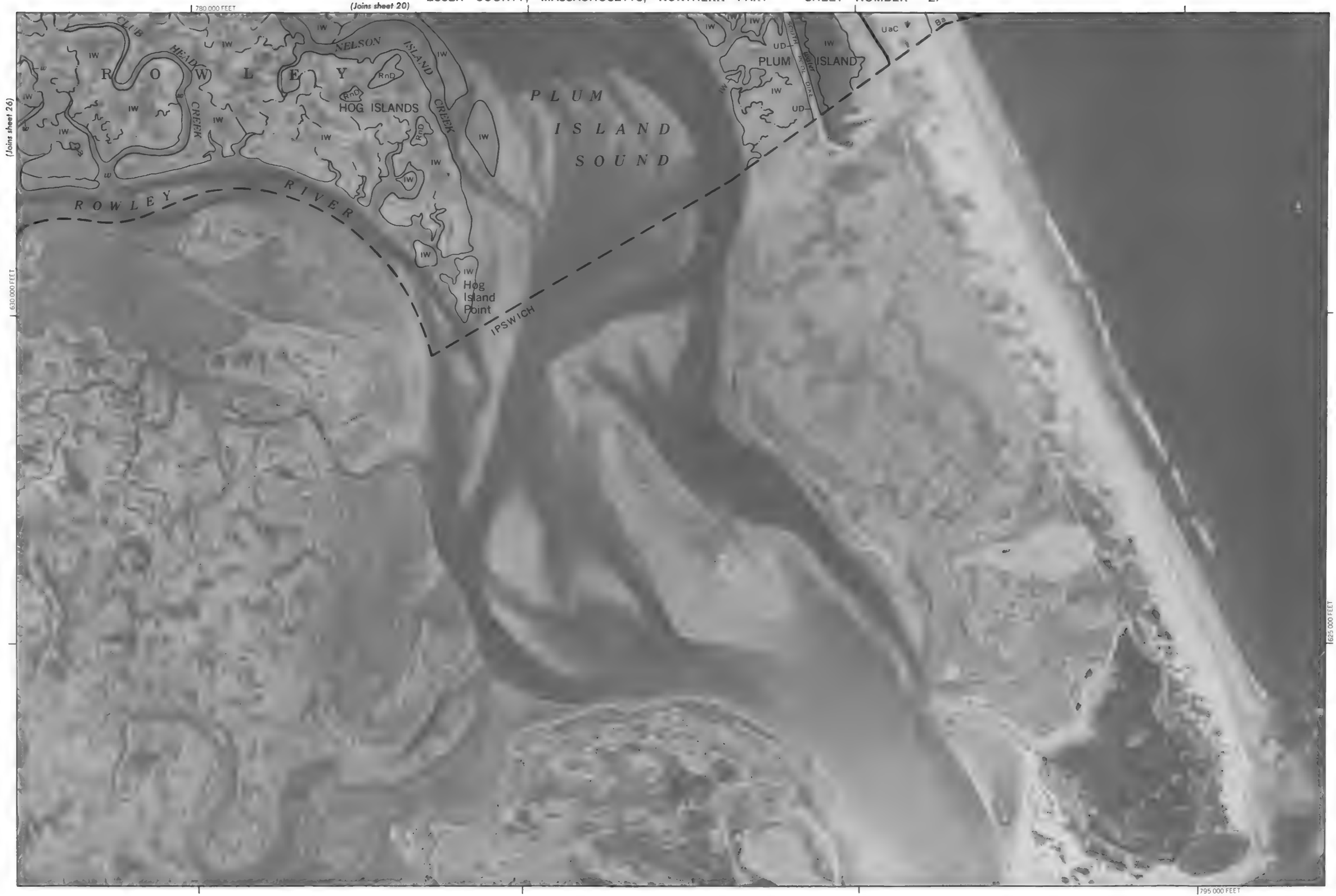
This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies

Coordinate grid ticks and land division corners, if shown are approximately positioned



This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown are approximately positioned

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART — SHEET NUMBER 27



27

N

1 Mile

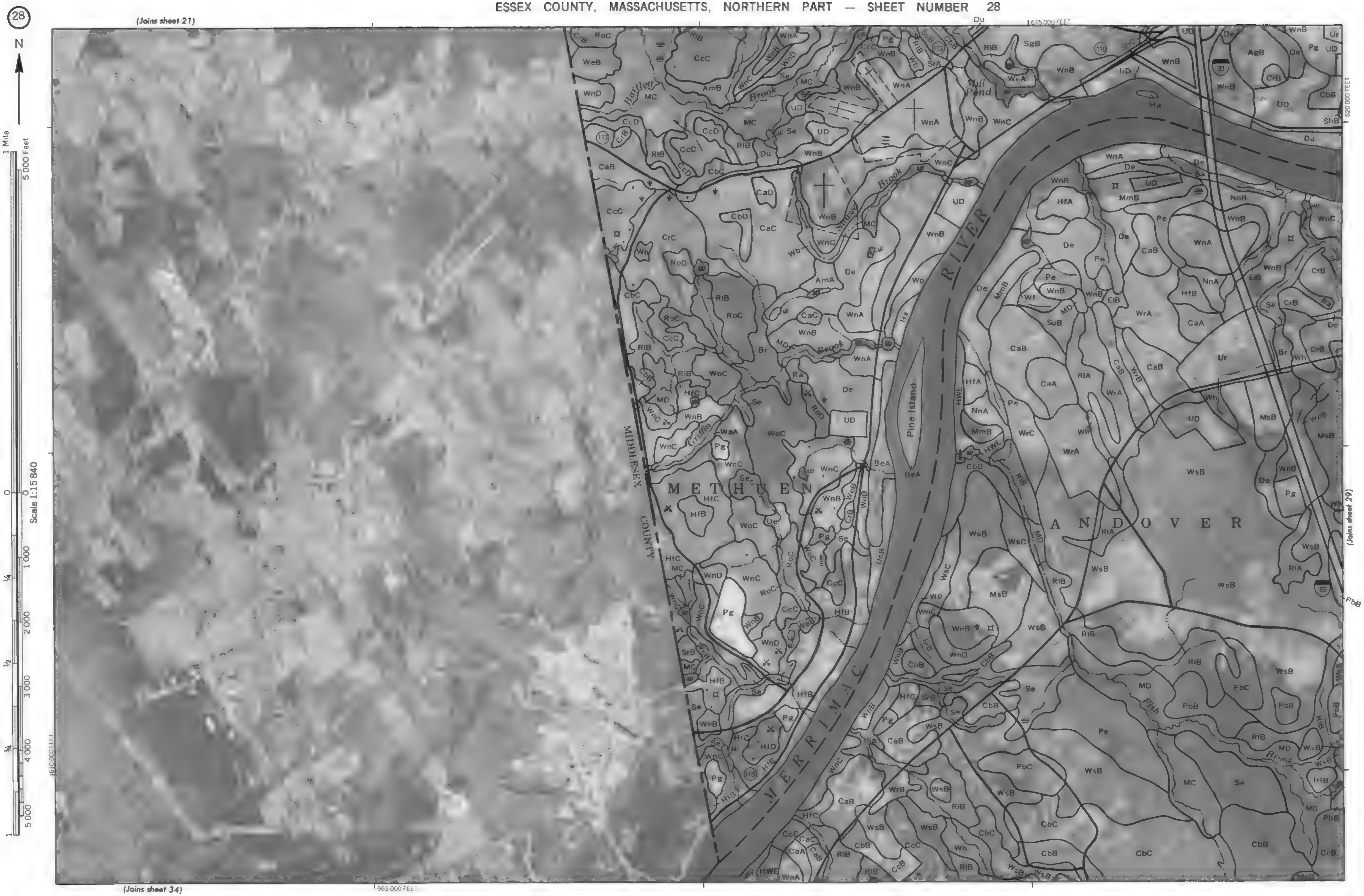
5,000 Feet

Scale 1:15 840

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 27

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies

Coordinate grid ticks and land division corners, if shown are approximately positioned



This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 29

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown are approximately positioned

1 Mile
5 000 Feet
Scale 1:15 840

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown are approximately positioned

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 30

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART — SHEET NUMBER 31

31

N

1 Mile

5 000 Feet

Scale 1:15 840

720 000 FEET

730 000 FEET

735 000 FEET

610 000 FEET

(Joins sheet 24)

(Joins sheet 30)

(Joins sheet 32)

(Joins sheet 37)

SHAVEN CROWN HILL

BALDPATE POND

Spofford Pond

BAYNS HILL

WOOD HILL

STILES POND

JOBS HILL

Kimballs Pond

Cedar Pond

Fourmile Pond

Stevens Pond

Lowe Pond

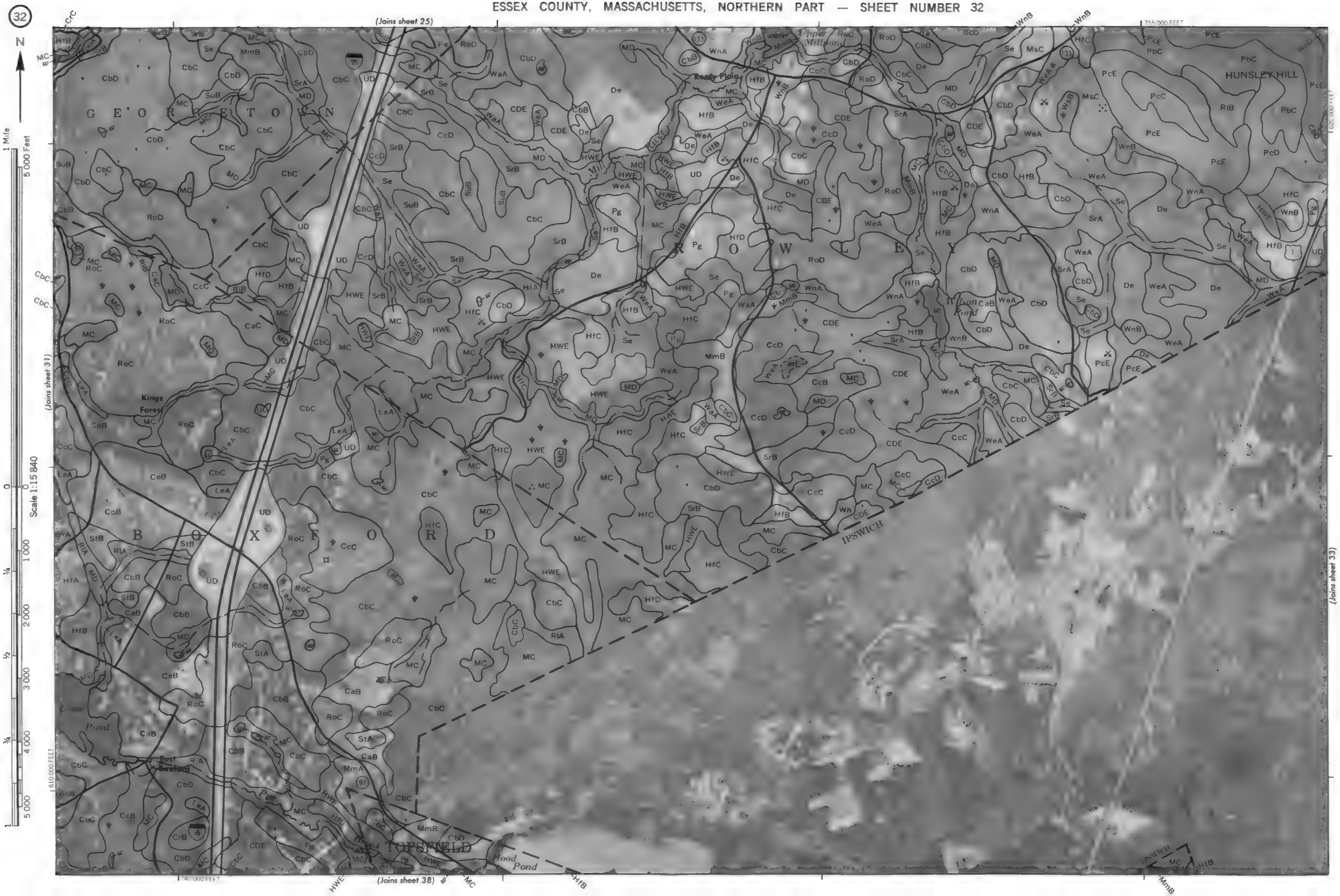
BOXFORD

NORTH ANDOVER

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 31

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies.

Coordinate grid ticks and land division corners, if shown are approximately positioned.



This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

1 Mile

5 000 Feet

Scale 1:15 840

ROWLEY

IPSWICH

(Joins sheet 26)

(Joins sheet 32)

760 000 FEET

620 000 FEET

INSET A

(Joins inset C)

PINE ISLAND

TOPSFIELD

IPSWICH

HAMILTON

Mile Brook

(Joins sheet 42)

594 000 FEET

595 000 FEET

1000 FOOT GRID TICKS

761 000 FEET

INSET B

ROCKINGHAM COUNTY, NEW HAMPSHIRE

SALISBURY

GRAPE HILL

(Joins inset, sheet 14)

688 000 FEET

686 000 FEET

(Joins sheet 3)

765 000 FEET

AND 5000-FOOT GRID TICKS

INSET C

IPSWICH

TOPSFIELD

HAMILTON

AVERIES ISLAND

RIVER

(Joins sheet 38)

605 000 FEET

600 000 FEET

610 000 FEET

(Joins inset A)

761 000 FEET

1000 AND 5000-FOOT GRID TICKS

765 000 FEET

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 33

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies.

Coordinate grid ticks and land division corners, if shown are approximately positioned.

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART — SHEET NUMBER 34

34

N

Scale 1:15 840

1 Mile

5 000 Feet

0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

675 000 FEET

(Joins sheet 28)

605 000 FEET

(Joins sheet 35)

665 000 FEET

(Joins inset)

(Joins lower right)

680 000 FEET

600 000 FEET

594 000 FEET

595 000 FEET

(Joins sheet 39)

(Joins 35)

678 000 FEET

1000 AND 2000-FOOT GRID TICKS

MERRIMAC RIVER

MIDDLESEX COUNTY

MIDDLESEX COUNTY

NEWBURY

WOOD HILL

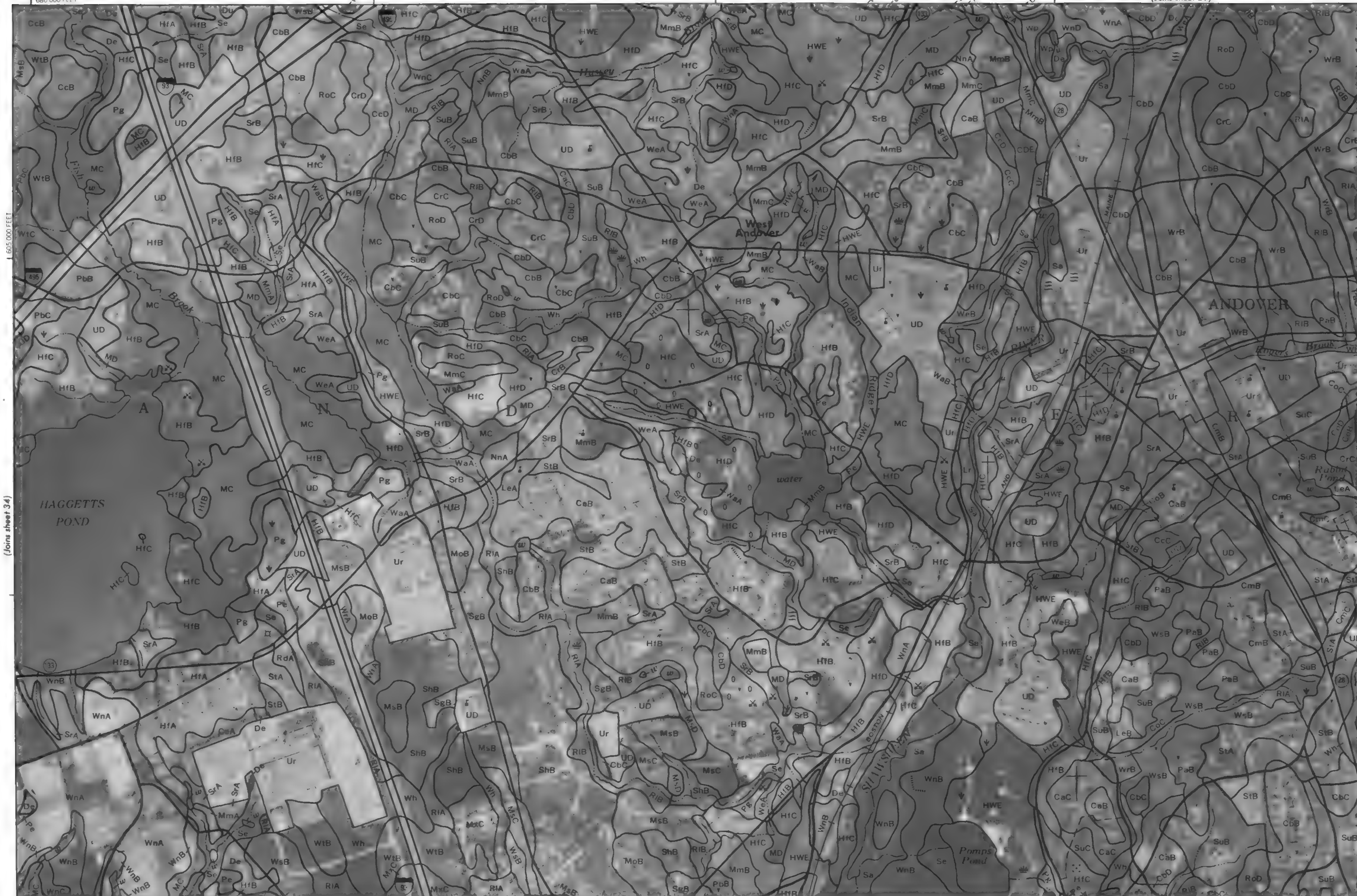
HAGGETTS POND

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture. Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown are approximately positioned

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 34

(35)

(Joins sheet 29)



(Joins sheet 39)

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

0 1000 2000 3000 4000 5000

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 35

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies.

Coordinate grid ticks and land division corners, if shown are approximately positioned

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART — SHEET NUMBER 36

36

N

1 Mile

5 000 Feet

Scale 1:15 840

715 000 FEET

605 000 FEET

600 000 FEET

700 000 FEET

(Joins sheet 30)

(Joins sheet 35)

(Joins sheet 37)

(Joins sheet 40)

WOODCHUCK HILL

CLAYPIT HILL

BOSTON HILL

HOLT HILL

NORTH ANDOVER

This map is compiled on 1977 aerial photography by the U.S Department of Agriculture, Soil Conservation Service and cooperating agencies

Coordinate grid ticks and land division corners, if shown are approximately positioned

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 36

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART — SHEET NUMBER 37

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 37

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown are approximately positioned

720 000 FEET

735 000 FEET

605 000 FEET

(Joins sheet 31)

(Joins sheet 36)

(Joins sheet 38)

(Joins sheet 41)

37

N

1 Mile

5 000 Feet

Scale 1:15 840

NORTHAMPTON

BOXFORD

MIDDLETON

MIDDLETON

TOWNE POND

Brook

Hales Pond

Fish

Crooked Pond

BALD HILL

MT ELEANOR

Sharpners Pond

water

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately positioned

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART — SHEET NUMBER 39

39

N

(Joins sheet 35)

(Joins inset, sheet 34)

(Joins sheet 40)

680 000 FEET

695 000 FEET

585 000 FEET

Ballardvale

POLE HILL

Lowell Junction

FOSTERS POND

Pomps Pond

Shawsheen River

MIDDLESEX COUNTY

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 39

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies.

Coordinate grid ticks and land division corners, if shown are approximately positioned.

1 Mile

5,000 Feet

Scale 1:15 840

ESSEX COUNTY, MASSACHUSETTS. NORTHERN PART — SHEET NUMBER 40

40

N

(Joins sheet 36)

715 000 FEET

595 000 FEET

(Joins sheet 39)

(Joins sheet 41)

700 000 FEET

1 Mile

5 000 Feet

Scale 1:15 840

1 0 1/4 1/2 3/4 1

5 000 0 1 000 2 000 3 000 4 000 5 000

NORTH ANDOVER

MIDDLESEX COUNTY

ESSEX COUNTY

Bear Pond

Brackett Pond

Collins Pond

Berry Pond

STEARNS POND

Sudden Pond

Salem Pond

Frye Pond

FIELD POND

Riley Brook

Scug River

water

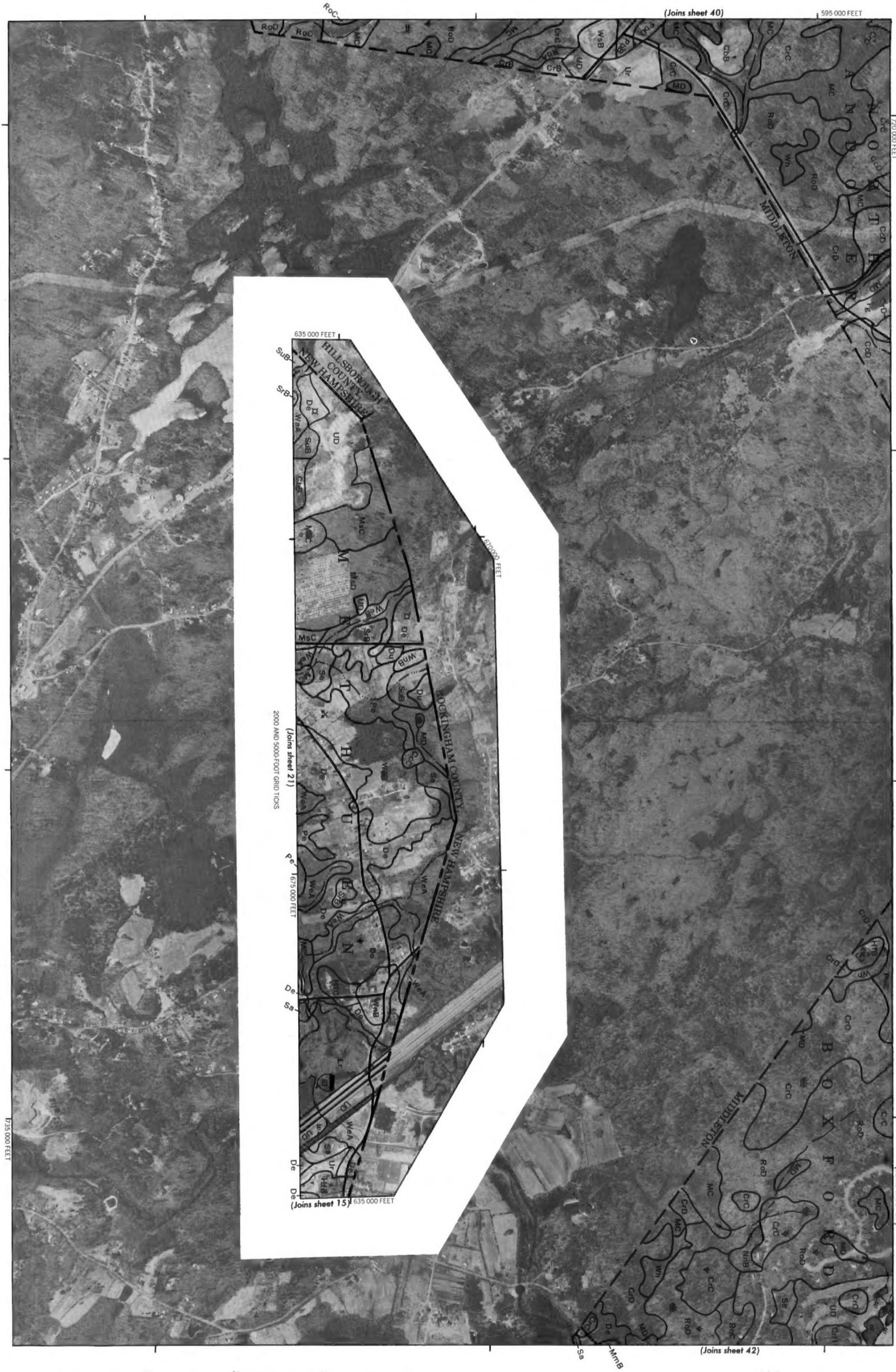
This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown are approximately positioned.

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 40

ESSEX COUNTY, MASSACHUSETTS, NORTHERTN PART NO. 41

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies.

Coordinate grid ticks and land division corners, if shown are approximately positioned.



ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART — SHEET NUMBER 41

1 Mile
5 000 Feet
Scale 1:15 840

N

41

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 38)

(Joins sheet 41)

(Joins inset A, sheet 33)

755 000 FEET

595 000 FEET

585 000 FEET

740 000 FEET

BOXFORD

TOPSFIELD

IPSWICH

HAMILTON

WENHAM

MIDDLETON

DANVERS

RIVER

Nichols Brook

REA FARM HILL

WITCH HILL

Pingree Hill

BRADSTREET HILL

water

This map is compiled on 1977 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown are approximately positioned.

ESSEX COUNTY, MASSACHUSETTS, NORTHERN PART NO. 42